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Motivated information acquisition and social norm formation ☆

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ABSTRACT

We investigate how individuals select sources of information about peers' behavior and normative views, and the influence of this social information on individual behavior and both empirical and normative expectations. This is explored through two experiments (N=1,945; N=2,414) using a lying game, with and without known political identification. Our findings reveal a self-serving bias in the selection of information sources, with a preference for lenient sources (i.e., those presenting more tolerant empirical or normative information about lying), particularly when these sources align with an individual's political identity. We observe that being exposed to information that suggests lying is more socially acceptable increases lying behavior. Additionally, while people's normative expectations are not swayed by observing their peers' actions, these expectations are influenced by information about what peers believe is the right thing to do, underscoring the role of normative information in shaping social norms.

1. Introduction

Norms serve as the foundation of our societies, guiding our selfish and cooperative decisions, enabling us to form social bonds, and are maintained through credible enforcement.[1] Crucially, norms are a property of an individual's relevant reference groups — that is, the people who matter to the decision-maker in specific choice situations (Bicchieri, 2006). In the process of informing our decisions, we often observe and imitate these people. This requires us to interpret the intentions of those around us, at times in self-serving ways. However, less explored are the mechanisms of how norms and compliance with them evolve, particularly in

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[1] E.g., Ostrom (2000), Bicchieri (2006), Krupka and Weber (2013), Kimbrough and Vostroknutov (2016), Fehr and Schurtenberger (2018), Villeval (2020), Bicchieri et al. (2021), Dimant and Gesche (2023). For a recent methodological discussion, see Bicchieri and Dimant (2019, 2023) and Bicchieri et al. (2022b).

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situations where individuals can choose whether and which norms to learn. Studying such *endogenous* norm formation is important in that it has the potential to contribute to explaining the increased polarization of opinions in society (Dixit and Weibull, 2007; Dimant, 2023). This can inform on the highly debated existence of online echo chambers and their role in polarization (see, *e.g.*, Flaxman et al., 2016; Cinelli et al., 2021; Ross Arguedas et al., 2022; Törnberg, 2022; Hobolt et al., 2023; Nyhan et al., 2023).[2]

Therefore, rather than simply *exogenously* imposing norm information on individuals (in the tradition of, *e.g.*, Schultz et al., 2007; Goldstein et al., 2008; Bicchieri et al., 2022a), we primarily focus on exploring the norm-related information that people actively seek out through their choice of information sources before making a decision. We investigate this process in the context of lying behavior, a domain where social norms are notably influential (*e.g.*, Posner, 2000; Gächter and Schulz, 2016). In our study, we characterize the sources of information in terms of political identity, though we remain agnostic about the direct relationship between lying behavior and political identification. This approach is informed by research underscoring the increasing political polarization, especially in the U.S. (Bursztyn et al., 2020a; Klein, 2020). As indicated by the existing literature, polarization may be driven by biased social learning among peers (*e.g.*, Centola, 2018; Golman et al., 2022). We propose that the endogenous selection of information sources could significantly affect the formation and influence of social norms. Therefore, a novel contribution of our paper is to understand how social norms form endogenously through the selection of information.

Existing research has largely explored peer effects on moral behavior in contexts where individuals could not choose their source of information and where social information was predominantly about peer *behavior* rather than prescriptions. We depart from this and address the following three research questions. First, we investigate the extent to which allowing individuals to choose their source of information about the prevailing social norm of lying leads to a biased and self-serving selection of information. Do people exhibit bias in their information search, favoring behavioral examples coming from peers who are likely to lie or who have more lenient normative views about lying? Is this bias stronger for individuals who lie? To fully capture these dynamics, we follow the existing literature by distinguishing two dimensions of norm-related expectations (Cialdini, 2003; Bicchieri, 2006): an empirical component that indicates *what other people do* (often referred to as *descriptive norm*), and a normative component that indicates *what other people (dis)approve of* (often referred to as *injunctive norm*). Across various treatments, we randomized whether participants observed empirical or normative information, never both.

Our second research question investigates whether the endogenous acquisition of information is influenced by the group identity of the source of information. The literature demonstrates that one's behavior and expectations are influenced by group identity in various domains, such as cooperation, coordination, and social preferences.[3] Despite existing research, there remains a considerable gap in our understanding of how group identity shapes the search for information, irrespective of whether group identity actually predicts the behavior or normative views in question. Individuals might assign different weights to the behavior and opinions of in-groups compared to out-groups. In certain situations, individuals may encounter congruent or incongruent information channels. We hypothesize that people tempted to exploit a lying opportunity may exhibit even greater bias in their search for social information when peers displaying more leniency in their behavior or normative approval of lying share the same group identity. On the other hand, if peers from the same group lie less or uphold stricter social norms, the search for information may be less biased towards lenient information. To explore whether group identity impacts the way people search for social information, we systematically varied the observability of peer identity and examined the resulting patterns.

Our third research question is whether and how empirical and normative information from peers affects individuals' propensity to engage in lying themselves and alters their expectations about the frequency and social disapproval of such behavior from others. We seek to understand if both empirical and normative social information equally influence individuals' behavior and their empirical and normative expectations. Furthermore, we explore whether behavior is more susceptible to influence than expectations, and if empirical expectations are more malleable than normative expectations. While existing literature primarily focuses on a single dimension (typically behavior), our study aims to investigate the relationships between social information and three relevant dimensions: own behavior, expectations about one's peers' behavior (= empirical expectations), and expectations about one's peers' normative standpoints (= normative expectations). We also consider how group identity affects these relationships to provide novel insights into how different aspects of social information shape individuals' decision-making in the presence of lying opportunities.

To explore the acquisition of social information and its effect on lying behavior and both empirical and normative expectations, we pre-registered and conducted two large online experiments with participants from the U.S.: the first experiment (n = 1945) is one in which information acquisition was *endogenous*; that is, participants were able to choose their source of information. In the second experiment (n = 2414), information was *exogenous*; it allowed us to measure the effect of social information on behavior and expectations and assess the importance of the selection bias in the Endogenous treatments. We used a 2 × 2 between-subjects design, varying whether individuals could acquire empirical or normative information about peers (but never both).

In the first experiment, participants repeatedly played a variant of the *mind game* (see Jiang, 2013; Galeotti et al., 2020; for external validation of this game see Potters and Stoop, 2016), which contained a lying opportunity where they could over-report a winning number without the risk of sanction. Lying at the individual level could be identified indirectly by the experimenter based on statistical inference. After playing the mind game, we elicited participants' empirical and normative expectations. We manipulated the presence of group identity in terms of political identification with the Democratic or Republican parties in the United States.

[2] Echo chambers are situations where individuals with moderate political views, who become disillusioned with mainstream news sources or the political establishment, may seek alternative sources of information, such as social media groups, that align with their growing dissatisfaction. In doing so, they expose themselves to more extreme viewpoints and may adopt norms that justify deviant political behavior, such as promoting conspiracy theories or engaging in civil disobedience.

[3] *E.g.*, Akerlof and Kranton, 2000; Goette et al., 2006; Efferson et al., 2008; Chen and Li, 2009; Benabou and Tirole, 2011; Li, 2020; Dimant, 2023.

Information about peers was obtained from a preliminary "Seed" session, where participants played the mind game in isolation for two sets of 20 periods each and subsequently reported their social norm expectations regarding the inappropriateness of different levels of over-reporting in this game, following Krupka and Weber (2013).

We manipulated the type of norm information that individuals could acquire while playing the lying game. Similarly to participants in the Seed session, a new set of participants played the same lying game in isolation for the first part and then, while accumulating norm-related information from past players, played the game again in the second part. Social information always provided one of two types of information: a peer's reporting behavior (empirical information) in the second part of the main game, or a peer's perception of the social norm regarding the disapproval of lying (normative information). Participants could not choose between receiving empirical or normative information but could sample peers associated with either above-median (more lenient) or below-median (stricter) information.

We manipulated the second dimension, the presence of group identity, by comparing two conditions. In the *Control* condition, the two sub-samples (more lenient vs. stricter sources of information) were only identified by one of two colors. In the *Group Identity* condition, each color was randomly and explicitly associated with a different political identity (Democrat or Republican). We randomized the associations so that sometimes sharing the same group identity (in-group setting) would correspond to *more* lenient behavior or normative expectations than the median, with the opposite for the out-group setting. Other times, sharing the same group identity would correspond to *less* lenient behavior or normative expectations than the median, with the opposite for the out-group setting. We thus observe and compare the information acquisition process of individuals with in-groups characterized by more or less lying or more or less lenient expectations, respectively. Additionally, by comparing with the Control condition, we test whether and when the distortion in information acquisition was intensified or reduced by the presence of group identity.

Our main findings reveal that individuals significantly favored sampling the above-median (more lenient) source of information over the below-median source. This preference for leniency was observed for both cheaters and non-cheaters in isolation. Information acquisition was partially self-serving, with a stronger leniency bias among cheaters. The introduction of group identity affected the way people selected their source of information. Both cheaters and non-cheaters exhibited homophilious preferences in terms of political identification during their search behavior. Furthermore, the exogenously manipulated (in)congruence between behavioral or normative leniency and partisan preferences influenced information acquisition. Compared to the Control condition, individuals were more (less) likely to sample from the more lenient source of information when this source was associated with in-groups (out-groups). Our results show that information acquisition was biased towards both more lenient information and partisan information, but people placed more weight on the identity-related origin of the information than on its very content, irrespective of the type of norm information (empirical or normative) being observed.

We present data from two experiments to examine whether peers' empirical and normative information affects individuals' lying behavior and their expectations. In the Endogenous Information treatments, there is a risk of selection bias affecting the identification of peer effects, as participants have the autonomy to choose their source of information. This might lead to individuals behaving like their peers or forming similar expectations not necessarily due to influence, but because they select peers with similar behaviors or expectations. However, this bias is avoided in scenarios where information is exogenously provided. In the Exogenous Information experiment, we exposed half of the participants to the same content of information as in the Group Identity condition of the initial experiment, but without their input in selecting the information. For the rest of the participants, the norm information content was still assigned exogenously, but with a polarized information source: 80% of the information was from in-groups sharing the same political identification. This modification was intended to increase the amount of polarized information, thereby expanding the scope of social learning. As in the Endogenous Information experiment, we exogenously varied the nature of the in-groups' information, manipulating whether it was below or above the median level.

Our findings indicate that consuming more lenient information leads to an increase in lying behavior, but this effect is only observed with normative information and is independent of the peers' political identity. In the Endogenous treatments, we observed a stronger association between lenient information and increased lying when the information came from in-groups, as opposed to out-groups. This pattern was not evident when the information was provided exogenously, possibly because participants in the Endogenous treatments were more inclined to select peers exhibiting similar behavior to their own. We did not find a causal effect of either empirical or normative information or the identity of peers on the formation of empirical expectations. However, normative expectations were influenced by exogenously provided normative information from peers. Conversely, when participants had the opportunity to choose their information source, social information did not affect their normative expectations, irrespective of the group identity of the peers. While normative expectations tend to be resistant to change in response to empirical information, as supported by existing literature (for example, Dimant et al., 2020; Bicchieri et al., 2022a), they appear to be more adaptable when individuals are exposed to exogenous normative information.

Our study offers new insights into the significance of normative information for understanding how individuals decide on their lying behavior and revise their expectations. This is a departure from the existing literature, which has predominantly focused on the impact of empirical social information. Our findings suggest that policy interventions might be more effective if they target altering perceptions of what is considered socially acceptable behavior. Additionally, we found that while group identity plays a crucial role in how individuals seek out information, it surprisingly does not exert a significant influence on the way social information impacts behavior and expectations. This observation could be particularly relevant and encouraging in the context of information dissemination on social media, suggesting that the influence of group identity might be less pronounced in shaping behavior and expectations than previously assumed.

The rest of this paper is structured as follows. Section 2 provides a brief review of the related literature. In Section 3, we present the design and procedures of the two experiments. Our conjectures are discussed in Section 4, while the results are presented in Section 5. Finally, we discuss these results and offer concluding remarks in Section 6.

2. Literature review

We build upon the existing literature by investigating individuals' motivated information acquisition to cope with uncertainty about social norms. Our study differs from previous research by examining individuals' selection of information sources, investigating self-serving biases in selecting both normative and empirical information, and comparing the influence of such information on behavior and expectation formation in both exogenous and endogenous social information settings. Our study contributes to three strands in the literature.

First, we contribute to the understanding of the formation of social norms and the role of social information in this process. The rapidly expanding economic literature on social norms has primarily focused on static frameworks where norms are common knowledge or settings where individuals receive exogenous normative or empirical information. However, there is a growing interest in normative uncertainty (d'Adda et al., 2020; Merguei et al., 2020; Bicchieri et al., 2022a; Dimant and Gesche, 2023; Dimant et al., 2024) and pluralistic ignorance, which refers to potential misperceptions about others' preferences and opinions (Bursztyn et al., 2020b; Smerdon et al., 2020).

In many real-world settings, people must explore their environment to obtain information about prevailing norms or others' preferences. Normative uncertainty, or uncertainty regarding which norm applies and to what extent a norm is preferred and followed, can arise from various factors, such as novel social or institutional environments, conflicts between opposing norms, or dissonance between empirical and normative information. In these contexts, individuals form context-specific empirical and normative expectations before making decisions (Chang and Sanfey, 2013; Acemoglu and Jackson, 2017; Bicchieri and Dimant, 2019). Amidst such uncertainty, conditional norm followers may self-servingly support the rule that is most favorable to them (Bicchieri and Xiao, 2009; Bicchieri et al., 2023). In the ethical domain, self-serving manipulation of beliefs can result from a biased selection of information or information avoidance (Dana et al., 2007; Spiekermann and Weiss, 2016; Grossman and van der Weele, 2017; Dimant et al., 2020; Soraperra et al., 2023), or from the fact that individuals stop searching as soon as they have found enough evidence supporting their positive moral self-views (Chen and Heese, 2021).

Second, our study contributes to the understanding of how group identity influences information search. Group identity has been shown to affect behavior in social encounters, with impacts on cooperation, coordination, competition, social preferences, and punishment (Akerlof and Kranton, 2000; Goette et al., 2006; Charness et al., 2007; Efferson et al., 2008; Chen and Li, 2009; Benabou and Tirole, 2011; Chen and Chen, 2011; Li, 2020; Dimant, 2023). It also influences network formation, thus, selective exposure to information, as individuals prefer to create homophilious links (Currarini and Mengel, 2016), particularly in the domain of unethical and criminal activities (Flashman and Gambetta, 2014; Gavrilova, 2019; Charroin et al., 2022). By focusing on political group identity, our study relates to the literature on the relationships between political polarization and segregated information exposure in echo chambers on social media platforms (Levy, 2021).

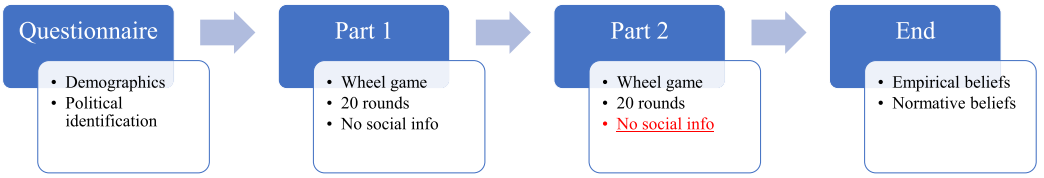
Lastly, we contribute to the economic literature on the impact of social information on lying. While several studies have studied the impact of peers on individuals' lying behavior (Fortin et al., 2007; Rauhut, 2013; Kroher and Wolbring, 2015; Bäker and Mechtel, 2019; Dimant, 2019; Benistant et al., 2022; Bicchieri et al., 2022a), to the best of our knowledge no existing research has compared the effect of normative social information depending on whether it is provided endogenously or exogenously. As one example, in an experiment where participants could choose to acquire information either about peers who were not able to cheat or about peers who were able to cheat, Charroin et al. (2022) showed evidence of homophily and conformity in behavior among those who were already cheating in isolation. Social information weighed the same on behavior, regardless of whether peers were selected or assigned exogenously. In contrast to this, our study varies the nature of information individuals can access (either normative or empirical information) and directly elicits empirical and normative expectations, allowing us to analyze whether information about peers' behavior is more influential in this process than information on peers' perceived norms.

3. Design and procedures

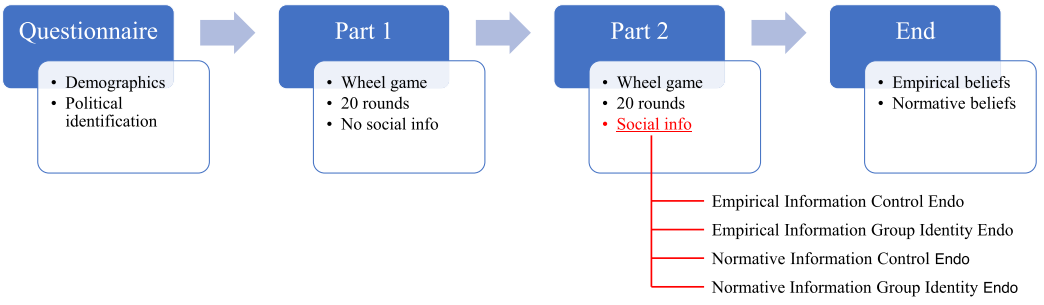
We conducted two successive experiments. The first, or main, experiment includes a Seed session without social information and four Endogenous Information treatments. The second experiment comprises four Exogenous Information treatments. We will describe the Seed session first, followed by the Endogenous Information treatments and the Exogenous Information treatments. Finally, we present the general procedures of the two experiments. We provide the timeline of the experiments in Fig. 1. To ensure high-quality data collection, data for all experiments was collected via Cloudresearch (a company specialized in collecting high-quality data on Amazon Mechanical Turk) and followed all recommended guidelines by using attention and comprehension checks, as well as CAPTCHAs (Buhrmester et al., 2018; Douglas et al., 2023).

3.1. The seed session

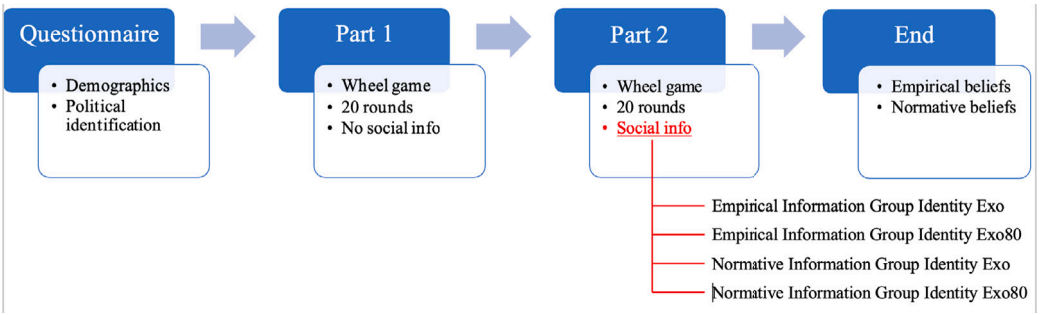
We conducted the Seed session prior to the other treatments. The objective of the Seed session was to generate truthful normative and empirical information that was then used in the other treatments. The Seed session included: (i) a brief socio-demographic questionnaire; (ii) a first sequence of a mind game that subjects played in isolation (that is, without receiving any feedback about the behavior of other participants) for 20 periods (we call this Part 1); (iii) a second sequence of the same mind game that subjects played in the same conditions for another 20 periods (we call this Part 2); (iv) a series of questions aimed at eliciting normative and empirical expectations. Parts 1 and 2 of the Seed session were identical. The need for these two parts will become evident later when we describe the Endogenous Information treatments. In each part, we let participants play the wheel game for 20 periods for comparison with previous work (see Galeotti et al., 2020), and to let participants adjust their behavior over time in response to different social information in the other treatments (see Sections 3.2 and 3.3).



(a) Seed Session ($N = 280$)



(b) Endogenous Information Treatments ($N = 1665$)



(c) Exogenous Information Treatments ($N = 2414$)

Fig. 1. Timeline of the experiment.

3.1.1. Questionnaire

At the beginning of the experiment, participants completed a brief socio-demographic questionnaire. We collected information about age, gender, income, and political identification. To measure political identification, we asked subjects to report whether they consider themselves as Republican, Democrat, Independent or other. Only subjects who declared themselves as Democrats or Republicans were allowed to continue the experiment. All the others were thanked and rewarded with a fixed bonus of $0.3 (answering only the questionnaire took about two minutes). To have a roughly equal share of Democrats and Republicans, the computer also dismissed some Democrats at random (about one every two).

It is possible that some participants misreported their political identification. This in itself is not a problem because we are not interested in the political preferences of our participants per se. The purpose of collecting information about political identification was to manipulate the group identity of the participants in the other treatments. Also, if some participants misreported the information about their political identification, this should make subjects less attached to this information. Hence, any result in the direction of political homophily (as we found) would be even more striking. Finally, as a robustness check, we also asked participants to report what they thought were the three most relevant socioeconomic problems from a list of different alternatives (like in Campos et al., 2017). We expected the answers to this question to suffer less from misreporting compared to political identification. In Appendix D, we show that the answers to this question were consistent with the self-reported political identification.[4]

[4] In the questionnaire, we also asked participants to state how much they agree with the goals of the Republican National Party and the Democratic National Party, respectively. The answers were coherent with the self-reported political identification (see Appendix D).

3.1.2. The wheel game (Part 1)

After the socio-demographic questionnaire, participants played a "wheel game" (Galeotti et al., 2020) for 20 periods. The wheel game is a variant of the mind game (Jiang, 2013), and it works as follows. A wheel with six empty squares was displayed on the participants' screen. Participants were asked to select one square in their head without reporting it to the experimenter (see an example in Figure B1 in Appendix B).[5] Once participants confirmed that they made their choice, the program randomly displayed an equal proportion of 1s and 0s in the six squares. Then, participants were instructed to report the number that appeared in the square they had previously chosen in their head. Reporting a 1 (the "winning number" or "success") entitled the participant to receive $1, while reporting a 0 paid nothing. The game allows to study lying behavior in a setting where participants can misreport their actual outcomes at no direct risk of detection and sanction. The experimenter can only infer whether a participant is a cheater or not by comparing the number of times the individual reports success with the theoretical outcomes of a binomial process where the probability of success is 0.5. Compared to conventional cheating paradigms (such as the die-rolling task of Fischbacher and Föllmi-Heusi, 2013), the wheel game can be easily implemented in online settings without the need for a physical device, like a die or a coin, that subjects might not have at their disposal.

3.1.3. The wheel game (Part 2)

Participants then played again the wheel game for another 20 periods in the same conditions as in Part 1. At the end of the experiment, the program randomly selected, for each participant, one wheel in each part. Participants' earnings were determined by the sum of the two numbers that they reported in these two randomly selected wheels.

3.1.4. Normative and empirical expectations

After the participants went through all the periods of the second wheel game, we elicited the participants' normative and empirical expectations about the behavior in the second wheel game. To elicit *normative expectations*, we used an incentivized coordination game *à la* Krupka and Weber (2013). Precisely, we described the case of an individual who drew ten winning numbers out of 20 wheels in the wheel game. We proposed 11 statements describing the 11 possible reports of this individual. The possible reports were 10, 11, 12, and so on up to 20 winning numbers. We asked the participants to indicate for each statement whether they believed that, according to most participants, this report was or not considered as socially inappropriate (see Figure B2 in Appendix B).[6] We used the switching point from *not inappropriate* to *inappropriate* to identify each participant's perceived injunctive social norm about what one ought not to do in the wheel game. For each statement, participants earned $0.03 each time they gave the same answer as that most frequently given by the other participants (in total up to $0.33 for this task).

Following Bicchieri and Chavez (2010), we used the same 11 statements to also elicit the participant's *personal normative expectations* (absent financial incentives), which indicates what a participant personally thinks is the right thing to do (see also Bašić and Verrina, 2021, for a recent discussion of personal norms). This allowed us to measure any discrepancy between personal views and the perceived social norm. Finally, we elicited the *empirical expectations* of the participants asking them to guess how many winning numbers the other participants reported, on average, in Part 2 of the wheel game. They could earn another $0.2 if their guess was correct within a margin of plus or minus 1.

3.2. Endogenous information treatments

The Endogenous Information treatments differed from the Seed session only with respect to Part 2 of the wheel game. Instead of playing the game in isolation (like in Part 1 or in the Seed session), in Part 2 participants received information about the behaviors or the normative expectations of the participants from the Seed session. Since information flowed one way from participants in the Seed session to participants in the other treatments, we avoided any reflection problem in measuring peer effects.

Sampling of the source of information. Participants sampled information in each period by clicking on one of two boxes on their screen, each one identified by a different color (yellow or purple). By clicking on one box, participants drew a past participant from the Seed session whose behavior or normative expectations, as explained below, were *equal to or above* the median (more lying behavior or more lenient expectations). By clicking on the other box, they drew a past participant from the Seed session whose behavior or normative expectations were *below* the median (less lying behavior or stricter expectations). The participants drawn from the Seed session changed in each period. Consequently, participants slowly accumulated norm-related information for 20 periods.

Participants were informed that all information came from past participants in the Seed session and that the two equally sized subsamples were built based on their reported number of successes or normative expectations. Crucial for our investigation, participants

[5] A difference with Galeotti et al. (2020) is that their wheels displayed numbers between 1 and 6, while, for the purpose of our investigation, our wheels only displayed 1s and 0s.

[6] As soon as they entered their first positive response ("inappropriate"), the boxes corresponding to the other statements were automatically filled in by the program; however, participants were informed that they could change any answer manually. This was done to limit multiple switching without imposing transitivity to the players. We opted for binary responses (inappropriate or not) to each statement rather than using a scale with multiple degrees of (in)appropriateness. This binary approach simplified the process of creating summary information about the threshold at which the majority of people consider a report to be inappropriate, according to each participant's perspective. This method made it easier to convey this threshold information to future participants in the study.

Table 1
Treatments with endogenous information acquisition.

	Control ($N = 549$)	Group Identity (GI) ($N = 1116$)
Empirical information ($N = 846$)	(1) Emp-Info control ($N = 285$)	(2) Emp-Info GI (Democrats Above Median) ($N = 276$) (3) Emp-Info GI (Republicans Above Median) ($N = 285$)
Normative information ($N = 819$)	(4) Norm-Info control ($N = 264$)	(5) Norm-Info GI (Democrats Above Median) ($N = 294$) (6) Norm-Info GI (Republicans Above Median) ($N = 261$)

were initially unaware of which sub-sample corresponded to which box (and its color), which they could learn through sampling.[7] We randomized at the individual level which color was associated with the below- or above-median source of information, and which one was displayed on the left or on the right side of the screen, to prevent the results from being driven by the experimental setup. A history table was displayed on the participants' screens when they sampled information. To facilitate learning, after the participant sampled a peer in a given period, the table was immediately updated with the newly acquired information by adding one line to the table (see examples in Figure B3 in Appendix B).

Experimental conditions. The four Endogenous Information treatments are summarized in Table 1. Across treatments, we varied two dimensions between subjects: the nature of the social information (empirical vs. normative information) and the presence of political group identity (control vs. group identity).

In the *Empirical Information condition* ("Emp-Info", hereafter), participants drew information about the total number of successes that peers from the Seed session reported in Part 2 of the wheel game (that is, with the same level of experience of the game). In the *Norm Information condition* ("Norm-Info", hereafter), participants drew information about the perceived social norm of peers from the Seed session, that is, the threshold from which the number of successes reported by someone who actually got ten winning numbers was considered socially inappropriate.[8]

The second dimension manipulated group identity in terms of political identification. In the *Control condition*, the two boxes used to sample individuals were only identified by a color (yellow or purple). In the *Group Identity condition*, each color was also associated with a political affiliation (Democrats *vs.* Republicans). The Group Identity condition was further divided into two between-subject sub-conditions. In one sub-condition, participants could sample either from Democrat participants whose normative expectations (Norm-Info) or behavior (Emp-Info) was above the median or from Republican participants whose normative expectations or behavior was below the median. In the other sub-condition, they could sample either from Republican participants whose normative expectations or behavior was above the median or from Democrat participants whose normative expectations or behavior was below the median. Depending on the condition, the political orientation of a given subject was associated with more lenient examples or, on the contrary, with stricter examples. Note that participants were informed of which political orientation was associated with which color, but they had to explore to identify which color was associated with above- or below-median information.[9]

3.3. Exogenous information treatments

In our Endogenous Information treatments, there is a risk of self-selection bias if participants predominantly select information from those similar to them. This bias could potentially distort our understanding of how information impacts behavior and expectations, a concern discussed in more detail by Charroin et al. (2022). To address this issue and eliminate the potential for such bias, information needs to be provided exogenously, not chosen by the participants. Furthermore, in our experiment, participants were not informed about the specific meanings attached to each color in the information groups. This lack of initial clarity meant they had to actively gather information from each group to learn which color signified more or less lenient attitudes towards lying. Had they been fully aware of these meanings from the start, some participants might have selectively sampled a greater amount of information from groups they identified with (in-groups), potentially leading to more pronounced peer effects.

To address these two considerations, we carried out a subsequent experiment incorporating a range of Exogenous Information treatments, which we pre-registered at AsPredicted#48859. The primary objective of this follow-up experiment was to evaluate

[7] We decided not to give direct information on which color corresponded to the above- or below-median sub-sample to minimize the presence of an experimenter demand effect. We also thought it was more natural to let participants discover the information themselves.

[8] It is important to note that past players' behavior may carry more comprehensive information than their normative expectations, as behavior can be shaped by both empirical and normative expectations. An interesting prospect for future research, building on our current study, would be to introduce a third experimental condition where subjects receive information solely about past players' empirical expectations. This would facilitate a more straightforward comparison between the pursuit of empirical and normative information. In our current study, we chose to focus on social information related to behavior or normative expectations. This decision is grounded in the existing literature, which indicates that individuals are influenced by social norms via two primary mechanisms: individuals tend to conform to a social norm if they perceive that a significant number of others adhere to it, and also if they believe that a substantial number of others think one should follow the norm.

[9] This procedure was made transparent to the participants. In particular, we informed them that the two sub-samples were defined based on the median behavior or normative expectations, but that we selected only participants from a given political orientation in each category.

Table 2
Treatments with exogenous information acquisition.

	Exogenous Info (N = 1189)	Exogenous Info 80 (N = 1225)
Empirical information (N = 1229)	(1) Emp-Info-Exo (Dem Above Median) (N = 304)	(5) Emp-Info-Exo80 (Dem Above Median) (N = 306)
	(2) Emp-Info-Exo (Rep Above Median) (N = 308)	(6) Emp-Info-Exo80 (Rep Above Median) (N = 311)
Normative information (N = 1185)	(3) Norm-Info-Exo (Dem Above Median) (N = 282)	(7) Norm-Info-Exo80 (Dem Above Median) (N = 310)
	(4) Norm-Info-Exo (Rep Above Median) (N = 295)	(8) Norm-Info-Exo80 (Rep Above Median) (N = 298)

whether participants' behaviors and expectations differed when they were exogenously exposed to social information, as opposed to selecting it endogenously. Additionally, this experiment aimed to expose participants to more polarized information, further enriching our understanding of its effects.

This follow-up experiment mirrored the structure of the initial one, encompassing a brief questionnaire, Part 1 of the wheel game without social information, Part 2 with social information, and the elicitation of empirical and normative expectations. Like the first experiment, we varied the type of social information (empirical vs. normative) and generated this information using data from the Seed treatment of the first experiment. However, a key difference in this experiment was the lack of choice for participants in selecting their information source; instead, the information was exogenously imposed on them. On average, about half of the participants were exposed to a similar proportion of in-group information as those in the Empirical Information (Emp-Info) and Normative Information (Norm-Info) conditions of the first experiment. This setup allowed us to assess the impact of social information when it is not self-selected but externally provided, offering a new perspective on its influence on behavior and expectations.[10] For the remaining participants, we artificially increased the share of empirical or normative information coming from in-group peers to 80% (on average) — meaning that, in each period, the probability of receiving in-group (out-group) information was 80% (20%).[11] In line with the structure of the Endogenous Information treatments, our experiment had two sub-conditions based on the nature of the in-group information received: one where the information from Democrats was above the median, and another where the information from Republicans was above the median. This division was contingent on whether the in-group data provided to participants was associated with above-median or below-median figures.

During the experiment, participants saw the same colored buttons indicating peers' political identification as in the Endogenous Information treatments. However, their interaction differed: they were not required to click any button but were instead informed about the source of the information. For half of the participants, the program randomly chose information based on the selection probabilities from the first experiment's corresponding condition. For example, if a Democrat was receiving empirical information, the likelihood of it coming from an above-median Democrat peer mirrored the actual percentage of Democrats who selected in-group information in the Emp-Info condition when Democrats were linked to above-median information. The primary difference between this and the first experiment was in the participants' role in selecting information, not in the expected content of that information. For the rest of the participants, the program predominantly selected in-group information, with a probability of 80%. We did not inform participants about the specific methodology for drawing information from the two sources; we only indicated that the computer program might select differing numbers of participants from one group compared to the other. Table 2 summarizes all 8 conditions of the Exogenous Information treatments.

3.4. Procedures

Number of observations. As per our pre-registration of the Endogenous Information treatments (AsPredicted#38103), a statistical power analysis determined that we needed to collect data from about 150 Republicans and 150 Democrats in each condition to achieve a statistical power of 80% at an alpha level of 5%. We recruited participants located in the United States through Amazon Mechanical Turk for our online experiment, focusing on individuals who identified as Democrats or Republicans. To maintain equal party representation, we randomly dismissed some Democrat participants. Despite the complex selection procedure, slightly imbalanced samples in certain conditions did not affect our conservative power analysis. In total, 1945 participants completed the experiment (see Table C1 in Appendix C). The Seed session had 280 participants (51.79% Democrats; 52.86% males; 41.20 years), the Emp-Info treatment had 846 (54.02% Democrats; 44.33% males; average age: 41.73 years), and the Norm-Info treatment had 819 (50.43% Democrats; 47.13% males; average age: 41.84 years).

For the follow-up experiment with the Exogenous Information treatments, we also pre-registered an objective of collecting data from about 150 Republicans and 150 Democrats in each of the eight conditions. We recruited 2414 new U.S. MTurk participants,

[10] In this follow-up experiment, we chose to focus solely on the Group Identity condition, rather than running the Control condition as well. Running both conditions would have required too many additional subjects and was not at the center of our investigation.

[11] This was done to increase the polarization of information in the data. Although we pre-registered the experiment with a 75% proportion of in-group information, we mistakenly implemented an 80% proportion in the program. No experiment was ever conducted with the 75% condition. Excluding the data from the 80% condition did not alter our results. We report this analysis in Appendix I.

maintaining the same proportion of Republicans and Democrats as in the main experiment (see Table C2 in Appendix C). Individuals with another political identification were excluded. In the Emp-Info condition (n = 1229), 50.61% were Democrats, 44.18% were males, and the mean age was 39.77 years. In the Norm-Info condition (n = 1185), 50.72% were Democrats, 48.44% were males, and the mean age was 39.81 years.

Earnings. All participants earned $0.3 for completing the initial questionnaire. Those who were allowed to continue after the questionnaire received an additional fixed bonus of $0.5, plus a variable payment that depended on their decisions in the experiment. On average, subjects in the Seed session and Endogenous Information treatments earned $2.03 (SD = 0.728) for a duration of about 15 min, which corresponds to an hourly wage of $8.12, which is well above the average hourly earnings on MTurk (Hara et al., 2018). Earnings in the Exogenous Information treatments were computed exactly as in the main experiment. Participants earned on average $2.04 (SD = 0.727) in these treatments for a similar average duration (15 min), corresponding to an hourly wage of $8.16.

4. Conjectures

We pre-registered five conjectures for the main experiment: the first two conjectures are related to the selection of information, while the last three concern the impact of social information on behavior, and on empirical and normative expectations.

We first conjectured that the selection of the source of information is biased. This conjecture builds on the idea that individuals are selective about what they want to observe and learn (Dana et al., 2007; Sharot and Sunstein, 2020), and they prefer to receive information from individuals who share similar preferences (Charroin et al., 2022). In particular, we anticipated that individuals are likely to select information self-servingly because observing others reporting more winning numbers or reporting a more lenient norm may reduce the moral costs of lying (Dimant, 2019; Bicchieri et al., 2023).

Conjecture 1. *Individuals who misreport are more likely to sample information from peers who provide above-median (i.e., more lenient) empirical and normative information.*[12]

Research on homophily has revealed that individuals have a preference for being matched with in-groups who share the same group identity because they value the reduction of the distance with their reference group (Haynie, 2001; Charness et al., 2007; Currarini and Mengel, 2016; Dimant, 2023). Thus, we conjectured that when the political identification of peers is public, individuals are more likely to sample peers with the same political identification, showing homophilious preferences in the selection of the source of information, regardless of whether these peers deliver below- or above-median empirical or normative information. The resulting conjecture is as follows:

Conjecture 2. *Political identity associated with more lenient (less lenient) empirical or normative information reinforces (decreases) the selection effect described in Conjecture 1.*

The following conjectures relate to the impact of social information. A long-standing stream of literature in economics and psychology has highlighted the impact of norms on behavior (for an overview, see Bicchieri and Dimant, 2019). We pre-registered the following conjecture: "Injunctive and empirical norms become more lenient and lying behavior increases after subjects choose their source of information". However, after pre-registering the experiment, we recognized that the appropriate approach is not to contrast behavior and expectations in isolation versus after receiving social information. Instead, the focus should be on understanding how behavior and expectations respond to the specific content of the social information received. Moreover, after collecting the data, we observed that participants, on average, cheated more in the Seed session than in the other treatments (Part 1: 13.13 vs. 12.23, t-test, $p < 0.001$; Part 2: 13.13 vs. 12.37, t-test, $p = 0.002$). This disparity in isolated behavior among different subject pools highlighted that the Seed session was not a suitable control for scenarios devoid of social information. This discrepancy rendered the test of our original hypothesis using these data ineffective. Therefore, we departed from our pre-registered hypothesis and revised our third conjecture to concentrate specifically on the impact of the content of social information.

Conjecture 3. *Behavior, empirical expectations, and normative expectations adjust to the leniency of peers' empirical and normative information.*

We hypothesized that peer information would exhibit a stronger influence on lying when it pertains to peers' behavior, drawing from Bicchieri and Xiao (2009)'s findings that empirical information significantly impacts individual decisions in a dictator game, more so than normative information. This could be because others' behavior potentially conveys more comprehensive information than their beliefs about the social norm, as it might also encapsulate these beliefs. Consequently, social information about behavior is inherently more intricate than information about normative expectations. Based on this understanding, we formulated our fourth conjecture as follows:

[12] Note that we used different terminology in the pre-registration and in the paper to designate leniency. In the pre-registration, we wrote: "Less honest individuals are more likely to sample information from peers with a below-median perception of the norm or below-median moral behavior". A "below-median perception of the norm or moral behavior" meant a more lenient perception or behavior, as it referred to morality. In this version of the paper, we preferred to refer instead to the reported number of winning numbers or the threshold above which a report is considered as socially inappropriate because they are objective measures. This is why a more lenient perception or behavior is defined in the rest of the paper as being "above-median". We adjusted the terminology in all the conjectures accordingly. Note that this change in terminology does not affect the meaning of the pre-registered conjectures.

Table 3
Summary statistics about behavior and expectations in the Seed session.

	All	Republicans	Democrats	Rank-sum	K-S
Behavior (Part 1)	13.13 (3.64) [13]	13.27 (3.29) [13]	13.01 (3.95) [12]	0.233	0.186
Behavior (Part 2)	13.13 (3.83) [13]	13.13 (3.59) [13]	13.13 (4.06) [13]	0.816	0.987
Empirical expectations	13.15 (3.30) [13]	13.06 (3.31) [13]	13.23 (3.31) [13]	0.563	0.756
Normative expectations	14.94 (3.63) [15]	14.86 (3.55) [15]	15.01 (3.71) [15]	0.734	0.883
Personal beliefs	14.88 (3.76) [15]	14.81 (3.54) [15]	14.94 (3.96) [15]	0.955	0.525

Notes. The first three columns report mean values, standard deviations (in round brackets), and median values (in squared brackets). The last two columns report the p-values of Mann–Whitney and Kolmogorov–Smirnov tests, respectively, comparing Republicans vs. Democrats.

Conjecture 4. *The impact of information is stronger when it is about behavior rather than about the perceived injunctive norm.*

However, if they select their source of information more based on political identification than on empirical and normative orientation, the impact of peer effects on lying may be conditioned on whether in-groups are associated with above- or below-median information. It is expected that more (less) lenient information from in-groups gives more (less) license to individuals to adjust their lying behavior. This leads to our fifth conjecture:

Conjecture 5. *Political identity associated with more (less) lenient norms or behaviors amplifies (decreases) the effect described in Conjecture 3.*

5. Results

In presenting our results, we first look at the Seed session and check that the information generated is balanced between Democrats and Republicans. We then examine how participants played the wheel game in Part 1 of the main experiment to get a sense of the extent of lying behavior in the absence of social information. We then turn to our main research questions, namely how participants endogenously selected norm-related information and how this affected their lying behavior and norm-related expectations (empirical and normative). Consistently with the structure of our experimental design, we break up the analysis by the presence of political group identity. Unless otherwise specified, the p-values correspond to two-sided tests throughout the paper. Each individual is treated as one independent observation.

5.1. Democrats vs. Republicans in the Seed session

Table 3 reports summary statistics about the behavior and the expectations of participants from the Seed session, distinguishing between Democrats and Republicans. We find no statistically significant difference in behavior and expectations between Democrats and Republicans (see last two columns of Table 3). This implies that, in both the Endogenous and the Exogenous Information treatments, we exposed Democrats and Republicans to information that came from comparable populations. In the rest of the analysis, we pool the data of Democrats and Republicans. We refer to social information that comes from peers with the opposite (same) political orientation as out-group (in-group) information.

The aggregate figures of Table 3 show that participants cheated both in Part 1 and Part 2. The average number of successes reported by the participants significantly exceeded the expected value of 10 in both parts (Wilcoxon signed-rank tests, WS hereafter, $p < 0.001$). Participants' empirical expectations, on average, matched quite well with the actual mean behavior. If we compare participants' guesses with the average reported number of successes in Part 2 (13.13), the difference is not statistically significant (WS, $p = 0.352$). While empirical expectations were on average accurate, there was substantial dispersion, with the majority of the participants (55.71%) underestimating the extent of cheating behavior. Turning to normative expectations, on average reporting 15 or more successes (when the actual number is 10) was considered socially inappropriate. There is also evidence that normative expectations were slightly stricter than personal normative views (WS, $p = 0.057$).

5.2. Lying behavior in isolation (Part 1)

To analyze the behavior in Part 1 of the main experiment, we pool the data from the Seed session and the Endogenous Information treatments. Part 1 was conducted without social information; therefore, it was equivalent across treatments. In Part 1, participants on average reported a success in 61.81% of the cases, which is significantly above chance (WS, $p < 0.001$). This indicates that participants tended to misreport the numbers in the wheels to their advantage but not to the full extent. A graphical illustration of this result is provided in Fig. 2, which displays the theoretical and empirical distributions of reported successes in Part 1.[13]

[13] Very similar results are obtained in the Exogenous Information treatments. We report them separately here as these treatments were not part of the main experiment. In the Exogenous Information treatments, subjects on average reported a success in 62.13% of the cases in Part 1, which is greater than chance (WS, $p < 0.001$), and not different from what we observe in the main experiment (Mann–Whitney rank-sum test, $p = 0.183$). The overall rate of misreporting (cf. footnote 14) is equal to 24.27%.

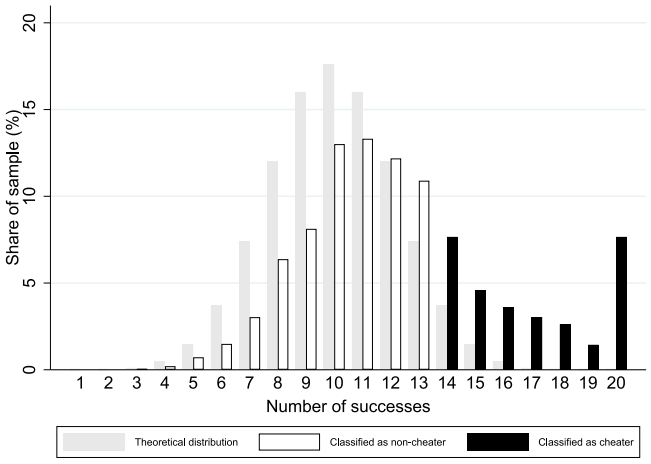


Fig. 2. Distribution of successes in Part 1. *Notes.* The figure displays the theoretical distribution of a binomial process with 20 independent draws, a theoretical success probability of 0.5 in each draw, and the empirical distribution of reported winning numbers. The empirical distribution pools the data from the Seed session and the Endogenous Information treatments. Participants are classified as cheaters if they report at least 14 winning numbers.

The figure shows that the empirical distribution is shifted to the right of the theoretical distribution. We can also compute the overall rate of misreporting by assuming that participants never lied to their disadvantage (i.e., reporting a 0 when the actual number was 1). This is equal to 23.61%.[14] This result is consistent with the existing literature on lying in mind games (*e.g.*, Jiang, 2013; Kajackaite and Gneezy, 2017; Dimant et al., 2020; Galeotti et al., 2020). At the individual level, we follow previous literature (Jiang, 2013) and classify individuals as "cheaters" if they reported *14 or more* winning numbers in the 20 wheels of Part 1. This threshold is computed based on a binomial test. With this cut-off point, the share of cheaters is 30.59%.[15]

5.3. Endogenous information acquisition (Part 2)

5.3.1. Control condition

First, we focus on the Control condition to examine information acquisition in the absence of group identity. Fig. 3 displays the average share of above-median (more lenient) information consumed by the participants. We break down our analyses by information condition (Emp-Info vs. Norm-Info) and participants' classification (cheaters vs. non-cheaters).[16] In the Emp-Info condition, the average share of above-median information consumed was 54.61% (non-cheaters: 53.52%; cheaters: 56.77%). In the Norm-Info condition, it was 54.53% (non-cheaters: 52.62%; cheaters: 58.83%). In both conditions, individuals selected more frequently the source of information (*i.e.*, the color) that was associated with more lenient information than more strict information (WS tests; Emp-Info: $p < 0.001$ overall; $p = 0.049$, non-cheaters; $p = 0.002$, cheaters; Norm-Info: $p < 0.001$ overall; $p = 0.012$, non-cheaters; $p < 0.001$, cheaters). As a result, both cheaters and non-cheaters consumed a share of lenient information higher than 50%, regardless of its nature (empirical or injunctive).

Moreover, individuals classified as cheaters consumed, on average, more lenient information than non-cheaters. In the Norm-Info condition, the difference in the consumption of more lenient information between cheaters and non-cheaters is always statistically significant, both if we pool all periods together (Mann–Whitney rank-sum test, MW hereafter: $p = 0.001$) or if we split the analysis into blocks of five periods, as is shown in Fig. 4 (periods 1–5: $p = 0.073$; 6–10: $p = 0.015$; 11–15: $p = 0.065$; 16–20: $p = 0.045$). In the Emp-Info condition, the difference is statistically significant only in the last periods (overall: $p = 0.130$; periods 1–5: $p = 0.245$; 6–10: $p = 0.776$; 11–15: $p = 0.082$; 16–20: $p = 0.024$).

Fig. 4 also shows that cheaters increased their consumption of more lenient information over time (Page's trend tests: $p < 0.001$ in Emp-Info; $p = 0.045$ in Norm-Info), whereas for non-cheaters, there is no clear trend in Emp-Info ($p = 0.435$) and only a small positive trend in Norm-Info ($p = 0.046$). In the beginning, participants did not know which source of information contained more lenient examples. Hence, participants drew examples from both sources. In the following periods, participants could have realized

[14] This is obtained by solving $s = 0.5 \cdot (1 - m) + 1 \cdot m$ for m, where s is the fraction of reported successes and m the fraction of misreports (see Cohn et al., 2014).

[15] According to a binomial test, we found that only when an individual reports 14 or more winning numbers does their reported proportion significantly deviate from what would be expected from an individual who never lies. Consequently, throughout the paper, we employ this threshold of 14 winning numbers as our cut-off point for analysis. Using a cut-off point at 13 (15, respectively) winning numbers, the share of cheaters is 41.49% (22.93%, respectively). Our results are robust to these alternative specifications.

[16] The division into cheaters and non-cheaters is data-dependent and not based on a treatment assignment. In Appendix K, instead of relying on this classification, we simply report the correlation between the number of successes reported in Part 1 and the share of above-median information consumed in Part 2, along with a scatterplot of the data. The results are in line with those reported in the current section.

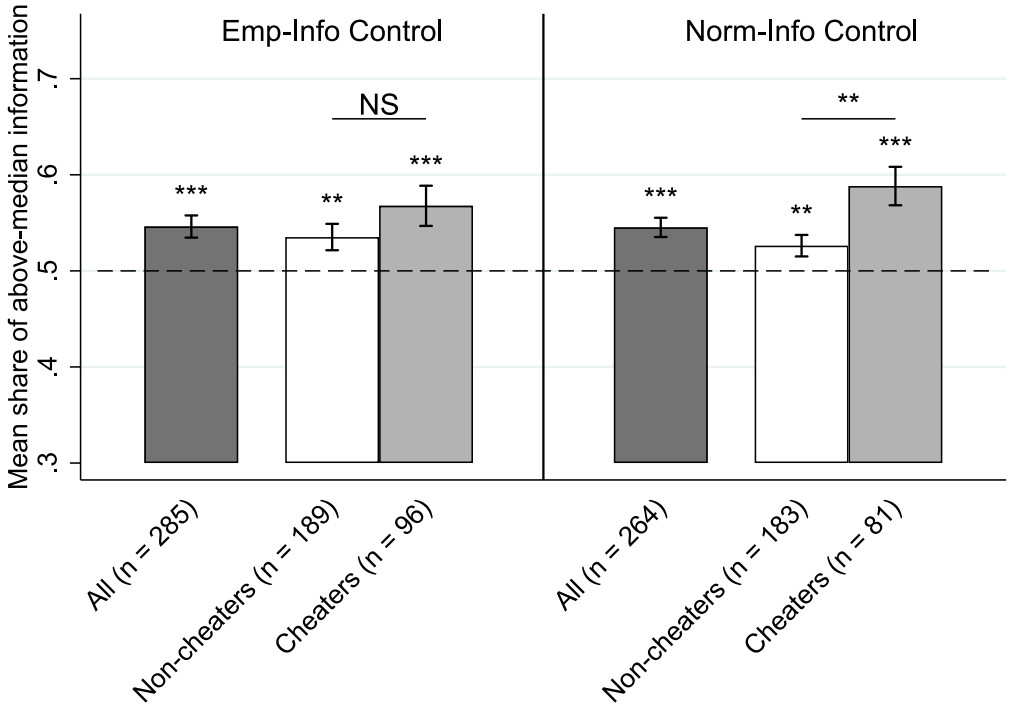


Fig. 3. Share of above-median (lenient) information consumed in the Control condition. *Notes.* The figure displays the mean share of above-median information consumed by the participants. The data are from the Control condition. The left panel is for Emp-Info and the right panel for Norm-Info. Participants are classified as cheaters if they reported 14 winning numbers or more in Part 1. Error bars denote standard errors of the mean. Significance of the mean (relative to a threshold of 0.5) is based on Wilcoxon signed-rank tests. Significance between cheaters and non-cheaters is based on Mann–Whitney rank-sum tests. NS: non-significant, * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

that one source of information provided more lenient examples than the other. Only cheaters strongly reacted to this knowledge by drawing an increasing number of examples from this source of information. Overall, this analysis supports Conjecture 1 and leads to the following result.

Result 1 (*Leniency Bias*)**.** *Cheaters and non-cheaters selected more lenient sources of empirical and normative information. This bias is stronger for cheaters than non-cheaters.*

5.3.2. Group Identity condition

Next, we examine the extent to which group identity affected the acquisition of information. We conjectured that individuals sample more frequently information from peers who share the same political identification as them (in-group peers). Thus, we expected homophily to increase (reduce) the individuals' consumption of more lenient information compared with the Control condition if peers with the same affiliation were associated with above- (below) median information. To test this conjecture, we contrast the Group Identity condition with the Control condition under Emp-Info and Norm-Info, respectively.

Fig. 5 displays the average share of above-median information consumed by participants in the Control and Group Identity conditions, respectively. For the Group Identity condition, we distinguish whether the in-group information was associated with below or above-median information. Panel (a) reports the data from all participants. Panel (b) considers only non-cheaters, while Panel (c) considers only cheaters.

The figure confirms the existence of homophilious preferences. Compared to the Control condition, participants in the Group Identity condition consumed significantly more (less) above-median information when this came from in-group (out-group) peers (MW tests, $p < 0.001$). This is true for both Emp-Info and Norm-Info, and for participants classified as cheaters and non-cheaters, respectively. On average, the increase (decrease) in the consumption of more lenient information was between 11% and 19% (21% and 28%) across conditions and participants' classification (see also Appendix E for an analysis of how the consumption of above-median information evolved over time in the Group Identity condition). This reveals that homophily and leniency bias mutually reinforced each other when in-group information was more lenient — participants consumed increasingly lenient information. Conversely, when in-group information was less lenient, homophily decreased the leniency bias — participants mainly consumed in-group information, with less regard for its leniency. This finding supports Conjecture 2.

Another way to study the impact of homophily in the information search is to look at the share of in-group information that participants consumed in each condition. Both in Emp-Info and Norm-Info, the consumption of in-group information was always

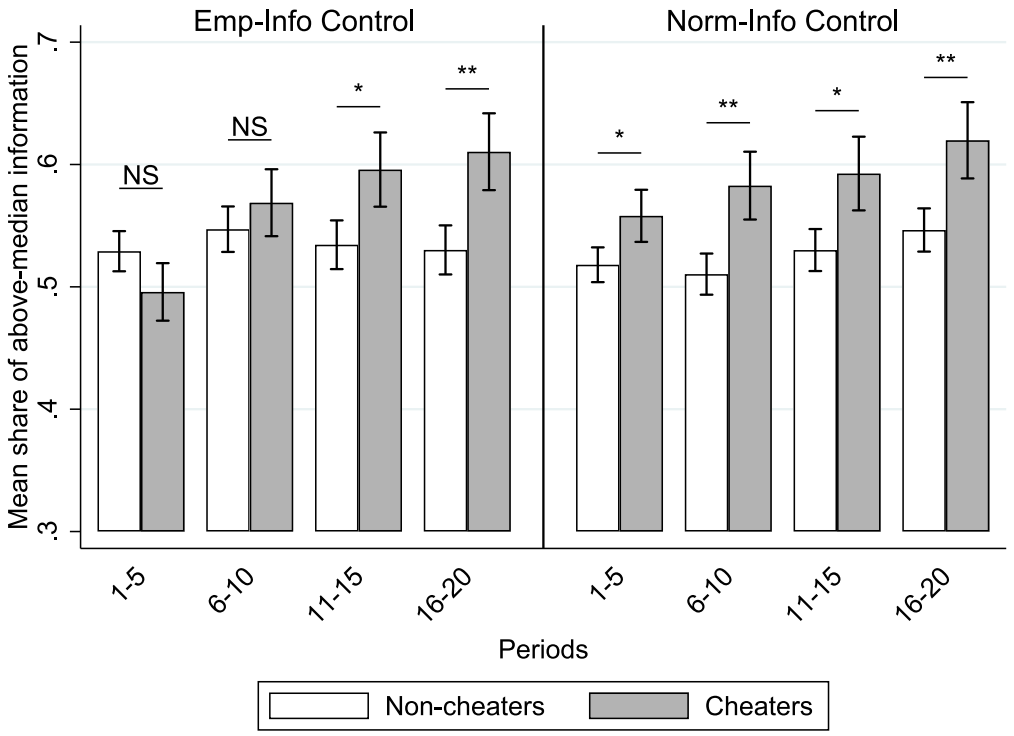


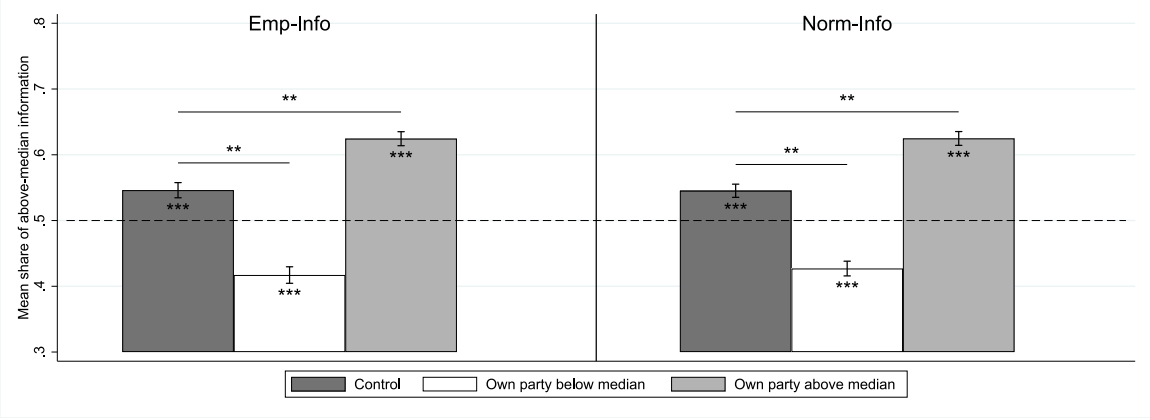
Fig. 4. Share of above-median information consumed in the Control condition over time. *Notes.* The figure displays the mean share of above-median information consumed by the participants across blocks of 5 periods. The data are from the Control condition. The left panel is for Emp-Info and the right panel is for Norm-Info. Participants are classified as cheaters if they reported 14 winning numbers or more in Part 1. Error bars denote standard errors of the mean. The significance between cheaters and non-cheaters is based on Mann–Whitney rank-sum tests. NS: non-significant, * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

significantly above 50%. This was true for both cheaters and non-cheaters, irrespective of whether the in-group information was associated with stricter or more lenient information (WS tests, $p < 0.05$ for each comparison). In Emp-Info, participants selected in-group information 62.44% of the times when this was associated with more lenient behavior (non-cheaters: 62.22%; cheaters: 63.07%), and 58.29% of the times when it was associated with stricter behavior (non-cheaters: 57.92%; cheaters: 59.43%). In Norm-Info, the selection of in-group information occurred 62.48% of the times when it was associated with more lenient expectations (non-cheaters: 59.36%; cheaters: 69.94%) and 57.30% of the times when it was associated with stricter expectations (non-cheaters: 58.28%; cheaters: 54.94%). The consumption of in-group information was similar between Emp-Info and Norm-info (MW tests; $p = 0.706$, overall; $p = 0.486$, non-cheaters; $p = 0.175$, cheaters). We also observe that participants chose more often in-group information when this was associated with more lenient information than when it was associated with stricter information (MW tests: $p < 0.001$ in both Emp-Info and Norm-Info). This is an effect of the leniency bias.

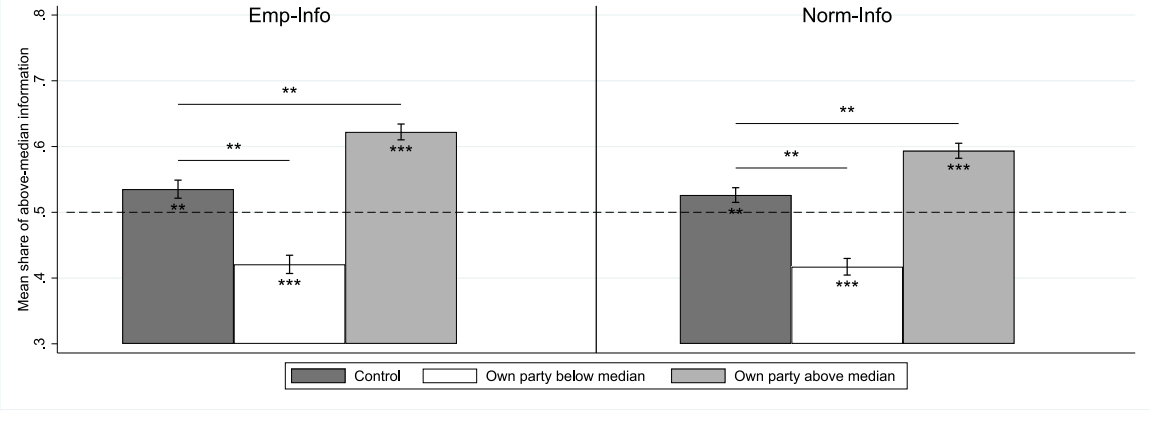
Finally, cheaters consumed more in-group information than non-cheaters but only in Norm-Info (MW tests: $p = 0.003$, Norm-Info; $p = 0.973$, Emp-Info). The effect is driven by the setting in which in-group information was above the median ($p < 0.001$, in-group above median; $p = 0.397$, in-group below median). This does not necessarily mean that cheaters exhibited more homophilous preferences than non-cheaters. It may actually indicate that cheaters preferred to consume more lenient information than non-cheaters (as we have seen in the Control condition) but they expressed this preference only when the information was injunctive and the leniency came from in-group peers. These results can be summarized as:

Result 2 (*Homophily*)**.** *Both cheaters and non-cheaters exhibited homophilous preferences in the selection of empirical and normative information. Homophily and the leniency bias reinforced each other when the in-group information was associated with more lenient information. Homophily reversed the leniency bias when the in-group information was associated with less lenient information.*

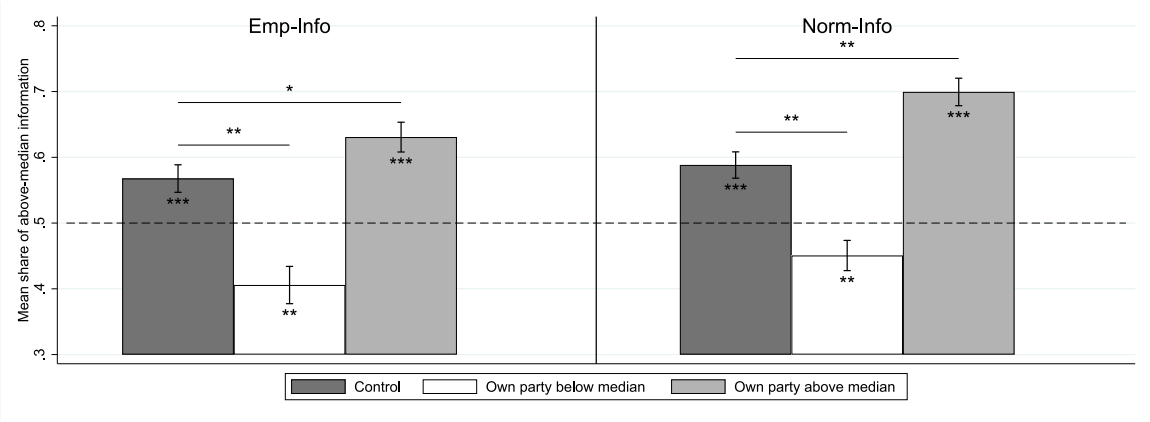
In support of these results, Appendix G reports a regression analysis to study information selection, controlling for individual heterogeneity. The analysis confirms that participants, especially those classified as cheaters, preferred to sample from the more lenient source of information (Model (1)). The effect was driven by the Norm-Info condition (Models (2) and (3)). Cheaters seemed to care more than non-cheaters about a more lenient perceived social norm, which supports Conjecture 1. Consistent with Conjecture 2 and Result 2, Models (1)–(3) also show that group identity significantly increased the consumption of more lenient information



(a) All subjects



(b) Non-cheaters



(c) Cheaters

Fig. 5. Share of above-median information consumed in Control and Group Identity. *Notes.* The figure displays the average share of above-median information consumed by participants in Control and Group Identity, respectively, and depending on whether the in-group information was associated with above-median (light gray bars) or below-median (white bars) information. Panel (a) considers all participants, Panel (b) considers only the non-cheaters, and Panel (c) considers only the cheaters. Participants are classified as cheaters if they reported 14 winning numbers or more in Part 1. In each panel, the left side is for Emp-Info, and the right side is for Norm-Info. Error bars denote standard errors of the mean. Significance of the mean (relative to a threshold of 0.5) is based on Wilcoxon signed-rank tests. Significance between conditions is based on Mann–Whitney rank-sum tests. NS: non-significant, * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

when this was associated with in-group peers, while it decreased it significantly when it was associated with out-group peers.[17] The regressions also show that individuals consumed more in-group information when it delivered more above-median rather than below-median information, and the effect was stronger among cheaters (see Models (4)–(6)). Overall, this analysis confirms that information acquisition is motivated.

5.4. Social information, behavior and expectations

5.4.1. Econometric specifications

We now explore the extent to which social information influenced behavior, empirical expectations (*i.e.*, participants' guess about other participants' behavior in the wheel game), and normative expectations (*i.e.*, participants' guess about other participants' perception of social approval of misreporting behavior). To address this objective, we include an econometric analysis in the same subsection, comparing data from both the Exogenous and Endogenous treatments. This consolidated analysis is designed to better highlight and assess the potential for selection bias in the Endogenous treatments.

We relied exclusively on data from Part 2 in the analyses of all treatments, given that the Seed session, as discussed in Section 4, did not serve as a relevant control due to higher levels of cheating among isolated participants compared to those in corresponding treatments. A difference-in-difference analysis between Parts 1 and 2 would be less insightful than an econometric analysis focusing on the effect of the specific content of social information on behavior in Part 2. Additionally, we did not conduct within-subject comparisons of empirical and normative expectations, as these were not elicited at the onset of either Part 1 or Part 2, to avoid complicating and lengthening the online experiment. This decision was also influenced by the potential for such comparisons to blur the impact of social information content received in Part 2 with the effects of repeated gameplay and associated learning.

We examine the effect of social information at the individual level using a regression analysis to account for the variation in the information received by the participants. For both behavior and expectations, we use the regression specification (1) for the Exogenous treatments and the regression specification (2) for the Endogenous treatments:

$$y_i = \beta_0 + \beta_1 Avg\text{-}Info_i + \beta_2(Avg\text{-}Info_i \times In\text{-}group_i) + \gamma X_i + \epsilon_i \tag{1}$$

$$y_i = \beta_0 + \beta_1 Avg\text{-}Info_i + \beta_2(Avg\text{-}Info_i \times In\text{-}group_i) + \beta_3(Avg\text{-}Info_i \times Control_i) + \gamma X_i + \epsilon_i \tag{2}$$

where y_i is either the proportion of winning numbers reported in Part 2 (behavior), the belief regarding the average number of winning numbers reported by others in Part 2 (empirical expectations), or the inappropriateness switching point (normative expectations) of participant i. $Avg\text{-}Info_i$ is the average information that the participant i received from other players (endogenously or endogenously, depending on the model). Since we run separate regressions for Emp-Info and Norm-Info,[18] $Avg\text{-}Info_i$ can be represented by the average number of winning numbers reported by the 20 peers of participant i or the average perceived social norm (measured by the average switching point in the norm elicitation task) of the 20 peers of participant i. $In\text{-}group_i$ measures the share of in-group information consumed by participant i, while $Control_i$ is a binary indicator for the Control condition (only present in model (2) since we do not have a Control condition without group identity in the Exogenous treatments). Therefore, β_1 captures the marginal effect of consuming more lenient information when this comes only from out-groups. β_2 measures the additional effect when information comes from in-groups. β_3 captures the additional effect when information is not associated with political identity (only in the Endogenous treatments). Finally, X_i is a vector of control variables.

In Tables 4–6, we report the estimates of Tobit regressions for behavior, empirical expectations, and normative expectations, respectively (see Appendix H for a similar analysis for cheaters and non-cheaters taken separately).[19] In each Table, the regressions reported in Panel A are estimated based on the data from the Emp-Info condition, while those reported in Panel B are based on the data from the Norm-Info condition. Models (1) and (3) correspond to the Endogenous treatments and use specification (2), while Models (2) and (4) correspond to the Exogenous treatments and are based on specification (1).[20] Despite the Endogenous and

[17] In Appendix F, we also analyze how the consumption of more lenient information evolved over time using linear probability and probit models. Besides confirming the results of Table G1 in Appendix G, we show that, in line with the non-parametric tests reported earlier, the consumption of more lenient information increased over time, especially for cheaters.

[18] We consider the two conditions separately because empirical and normative information is not directly comparable. For example, moving the number of successes from 12 to 13 may not have the same meaning as moving from 12 to 13 the norm about over-reported successes.

[19] We used Tobit instead of OLS regressions because the data are left and/or right-censored. OLS regressions yield qualitatively identical results and are available upon request. For consistency with the analysis of expectations (for which we do not have period-level data), we do not analyze the behavior on a period-by-period basis in the main paper, as initially pre-registered. Note also that such analysis would be noisier because it would be sensitive to the period-by-period fluctuations due to luck, and modeling the relationship between social information and behavior would be more challenging due to potential lagging effects. We do this in Appendix J, where we examine the dynamic effects of social information received up to time $t-1$ on behavior at time t. The results of this analysis confirm the findings reported in the main paper.

[20] We pool the data from the Exogenous condition and the Exogenous 80% condition to increase statistical power. These conditions differ only in the proportion of information coming from in-group peers. As a robustness check, we also ran the same regressions without the data from the 80% condition, to preserve as much as possible parallelism between the Endogenous and Exogenous experiments. The results, available in Appendix I, qualitatively replicate those reported in the main paper with two key differences: Avg-Info is no longer statistically significant when we assess the effect of normative social information on behavior, while empirical expectations do respond to empirical social information but only when information comes from in-groups. However, because the coefficient of $Avg\text{-}Info$ actually increases when polarized cases are excluded, the first difference is primarily due to the drop in sample size (by half), thus reinforcing the main qualitative findings of the study.

Table 4
Effects of social information on reporting behavior.

	Panel A: Emp-Info		Panel B: Norm-Info	
	ENDO (1)	EXO (2)	ENDO (3)	EXO (4)
Avg-Info	0.040	0.097	0.415***	0.178**
	(0.107)	(0.088)	(0.126)	(0.083)
Avg-Info × In-Group	0.135**	−0.025	0.186***	0.011
	(0.060)	(0.060)	(0.064)	(0.051)
Avg-Info × Control	0.087**	–	0.109**	–
	(0.042)		(0.044)	
Constant	12.525***	11.594***	6.503***	10.710***
	(1.484)	(1.173)	(1.802)	(1.276)
Controls	Yes	Yes	Yes	Yes
Observations	846	1229	819	1185
Wald χ^2	34.30	15.40	69.82	40.41
Log-likelihood	−2254.112	−3344.687	−2183.965	−3181.241

Notes: Tobit regressions. Standard errors are in parentheses. The regressions reported in Panel A (B) are based on the data from the Emp-Info (Norm-Info) conditions. Models (1) and (3) correspond to the Endogenous treatments and are based on specification (2). Models (2) and (4) correspond to the Exogenous treatments and are based on specification (1). There is one observation per individual. In all models, the dependent variable is the proportion of winning numbers reported in Part 2 by a participant. Controls: age, gender, educational attainment, annual pre-tax income, political orientation, left button above the median, yellow button above the median. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Exogenous experiments being preregistered and conducted independently, we chose to present their findings within the same section. This approach enables us to directly assess the impact of social information on behavior, empirical, and normative expectations, as observed in the Endogenous treatments. At the same time, it allows us to interpret the differences in outcomes between the Exogenous and Endogenous treatments as evidence of potential selection bias in the latter. This comprehensive presentation of results from both experiments provides a more nuanced understanding of the effects of social information.

5.4.2. Effect on behavior

Table 4 shows that peer information had no systematic effect on behavior. The effect was positive when the information was injunctive, as it is statistically significant even when the information originated from out-groups, in contrast to when the information was empirical. This is shown in Models (3) and (4) of Panel B, where the coefficient for $Avg\text{-}Info_i$ is positive and statistically significant in both Exogenous and Endogenous treatments (although the size of the coefficient is smaller in the Exogenous treatments). This indicates that the participants reported more successes as they consumed more lenient normative information.[21] This supports Conjecture 3. In contrast, the coefficient for $Avg\text{-}Info_i$ is close to zero and insignificant in Models (1) and (2). This goes against Conjecture 3 but also against Conjecture 4 which predicted a stronger effect of information on peers' behavior than on their normative expectations.

In the Endogenous treatments, consuming more lenient information was associated with more cheating when the information was coming from in-groups rather than out-groups. This is highlighted by the positive and significant coefficient of the interaction term between $Avg\text{-}Info_i$ and $In\text{-}Group_i$ in Models (1) and (3). A similar but slightly weaker relationship is observed when the information was not associated to any political identification: the coefficient of $Avg\text{-}Info_i \times Control$ is slightly smaller but significant in both models; a comparison between the coefficients of the two interaction terms yields a significant result in Model (3) ($p = 0.017$) but not in Model (1) ($p = 0.121$). In contrast, the interaction term between $Avg\text{-}Info_i$ and $In\text{-}Group_i$ is not significant in Models (2) and (4), indicating that in the Exogenous treatments, increasing exposure to more lenient normative information from in-group peers did not amplify the peer effects on behavior. This lack of significance suggests that selection bias influenced the estimates in Models (1) and (3), meaning that information from in-groups did not necessarily have a stronger impact than that from out-groups. In these treatments, the observed positive correlation between behavior and information from in-groups could be attributed to participants tending to choose peers with similar behavior for their information source. This implies that participants were not more influenced by in-group information (otherwise, the interaction term would have been significant in Models (2) and (4)); rather, they were selectively sourcing information from peers who exhibited similar behavior. Based on these findings, we conclude that Conjecture 5 is not supported.

We can thus report the following main result:

Result 3 (*Effects of Social Information on Behavior*)**.** *Individuals who consumed more lenient social information exhibited more cheating behavior only when the information was normative, regardless of peers' political affiliation.*

[21] The coefficient for $Avg\text{-}Info_i$ represents the marginal effect of consuming more lenient information from out-groups. However, since both the coefficients of Avg-Info × In-Group and Avg-Info × Control are positive, we can conclude that the participants consistently reported more successes as they were exposed to more lenient normative information, regardless of the identity associated with that information. As we will discuss later, assigning an in-group identity or no identity at all to the information, if anything, enhances the impact of consuming more lenient information on behavior compared to out-group information.

Table 5
Effects of social information on empirical expectations.

	Panel A: Emp-Info		Panel B: Norm-Info	
	ENDO (1)	EXO (2)	ENDO (3)	EXO (4)
Avg-Info	0.307***	0.087	0.479***	−0.045
	(0.098)	(0.107)	(0.116)	(0.107)
Avg-Info × In-Group	−0.085	0.106	−0.050	0.102
	(0.055)	(0.073)	(0.059)	(0.066)
Avg-Info × Control	−0.018	–	−0.035	–
	(0.038)		(0.040)	
Constant	9.921***	11.291 ***	6.682***	12.934***
	(1.350)	(1.427)	(1.669)	(1.634)
Controls	Yes	Yes	Yes	Yes
Observations	846	1229	819	1185
Wald χ^2	25.59	35.10	32.14	23.47
Log-likelihood	−2225.369	−3589.380	−2192.838	−3466.649

Notes: Tobit regressions. Standard errors are in parentheses. The regressions reported in Panel A (B) are based on the data from the Emp-Info (Norm-Info) condition. Models (1) and (3) correspond to the Endogenous treatments and are based on specification (2). Models (2) and (4) correspond to the Exogenous treatments and are based on specification (1). There is one observation per individual. In all models, the dependent variable is the belief of a participant on the average number of winning numbers reported by others in Part 2. Controls: age, gender, educational attainment, annual pre-tax income, political orientation, left button above the median, yellow button above the median. *** $p < 0.01$.

Table 6
Effects of social information on normative expectations.

	Panel A: Emp-Info		Panel B: Norm-Info	
	ENDO (1)	EXO (2)	ENDO (3)	EXO (4)
Avg-Info	0.125	0.098	−0.193	0.245**
	(0.155)	(0.125)	(0.172)	(0.107)
Avg-Info × In-Group	−0.047	−0.109	−0.057	−0.058
	(0.087)	(0.085)	(0.087)	(0.065)
Avg-Info × Control	0.015	–	−0.047	–
	(0.060)		(0.059)	
Constant	14.607***	15.372***	18.668***	11.556***
	(2.134)	(1.669)	(2.472)	(1.635)
Controls	Yes	Yes	Yes	Yes
Observations	846	1229	819	1185
Wald χ^2	8.86	29.21	15.93	19.22
Log-likelihood	−2028.604	−2892.283	−1935.028	−2761.581

Notes: Tobit regressions. Standard errors are in parentheses. The regressions reported in Panel A (B) are based on the data from the Emp-Info (Norm-Info) condition. Models (1) and (3) correspond to the Endogenous treatments and are based on specification (2). Models (2) and (4) correspond to the Exogenous treatments and are based on specification (1). There is one observation per individual. In all models, the dependent variable is the inappropriateness switching point of a participant. Controls: age, gender, educational attainment, annual pre-tax income, political orientation, left button above the median, yellow button above the median. *** $p < 0.01$.

5.4.3. Effect on norm-related expectations

Table 5 reports the estimates of our regression analysis for empirical expectations. In the Endogenous treatments, the coefficient for $Avg\text{-}Info_i$ in Models (1) and (3) is positive and statistically significant with no additional effect of information coming from in-groups (none of the interaction terms turns out to be statistically significant, rejecting again Conjecture 5). However, we cannot infer from this alone that observing more lenient empirical and normative information moved empirical expectations upward because the coefficients for $Avg\text{-}Info_i$ in Models (2) and (4) for the Exogenous treatments are not significant.[22] This again suggests that a selection bias affected the estimates of Models (1) and (3): individuals with higher empirical expectations tended to select information from peers who likely held the same higher expectations. Therefore, our analysis controlling for a possible selection bias does not support Conjecture 3.

Table 6 reports the estimates of our analysis for normative expectations. It reveals an interesting pattern. On the one hand, it shows no significant correlation between empirical or normative information and normative expectations in Models (1) and (3) (none of the coefficients reported in the table is statistically significant). This is true irrespective of whether the information came from in-groups, out-groups, or individuals whose political identity was unknown. On the other hand, while no coefficient is significant in Model (2) (showing no causal effect of empirical information on normative expectations), Model (4) returned a positive and

[22] However, a test on the sum of the coefficients for $Avg\text{-}Info$ and $Avg\text{-}Info \times In\text{-}Group$ in Model (2) yields a significant result ($p = 0.024$), which indicates the presence of some peer effects of empirical information also in the Exogenous treatments.

significant (at the 5% level) coefficient of $Avg\text{-}Info_i$. This indicates that normative information increased normative expectations in the Exogenous treatments, irrespective of whether the information came from in-group or out-group peers (the coefficient of the interaction term between $Avg\text{-}Info_i$ and $In\text{-}Group_i$ is not significant). This observation points to the persistence, or "stickiness", of normative expectations when faced with empirical information about peers' behavior. However, it also shows some adaptability of these expectations in response to others' normative beliefs. Interestingly, this malleability to normative beliefs diminishes when individuals have the autonomy to select their source of information. This analysis supports partially Conjecture 3 and rejects again Conjectures 4 and 5. We report the following result:

Result 4 (*Effects of Social Information on Norm-Related Expectations*)**.** *Our findings indicate that neither empirical nor normative information, nor the identity of the peers providing this information, has a causal effect on the formation of empirical expectations. Furthermore, normative expectations do not change in response to empirical information. However, they do react to normative information when it is provided exogenously. This suggests a distinct pattern in how different types of social information influence expectations, with normative information playing a unique role in shaping normative expectations.*

Overall, our results show that normative social information has a stronger effect than empirical social information.

6. Discussion and conclusion

Previous literature has explored peer effects on moral behavior in contexts where individuals could not choose their source of information and where social information was predominantly about peer *behavior* rather than prescriptions. Here, we examined experimentally the complex relationship between peer effects and individual lying behavior when individuals can choose their source of information in the context of social norms formation.

Our contribution is to investigate how the search for empirical information (actual behavior of peers) and normative information (peers' beliefs about what is acceptable) is influenced by individuals' own attitudes towards cheating and the political identity of their peers. We are particularly interested in whether people prefer information coming from those sharing similar political views. A key feature of our design is the exogenous manipulation of political identity to align either congruently or incongruently with the leniency of the behavioral information (how much peers lie) or the normative information (peers' beliefs about the acceptability of lying). This setup allows us to observe how individuals manage conflicts between their group affiliation and their cheating behavior. We examine whether they seek lenient information that aligns with their own behavior or if they opt for stricter empirical and normative standards. Similarly, we study whether individuals prioritize the group affiliation of the source or the content of the behavior and normative views when searching for information. Our study involved contrasting different scenarios where individuals either had the option to choose their sources of information or were provided these sources exogenously. This comparison was crucial to better understand how social information impacts lying behavior, normative expectations, and empirical expectations.

Our first key finding is that when individuals have the freedom to choose, they generally gravitate towards sources offering more lenient information. This trend is particularly strong among those who already exhibit cheating behavior in isolation, and it holds true for both empirical (actual behaviors) and normative (beliefs about acceptability) types of information. The second key finding emphasizes the substantial influence of group identity on selecting information sources, even when this identity does not directly inform the task at hand. Specifically, we observed that homophily — the tendency to associate with similar others — either intensifies or diminishes the leniency bias, depending on whether the in-group information aligns with more or less lenient standards. This result is noteworthy as it demonstrates that political identification can play a moderating role under certain conditions. While our experiment set up extreme scenarios associating each type of information exclusively with one political group, the findings still underscore the complex trade-offs individuals make between different sources of information when deciding to lie. From a policy perspective, these insights suggest that increasing the transparency and diversity of information sources could be effective in countering self-serving biases, as indicated in the literature (Gelfand et al., 2022; Bicchieri and Dimant, 2023).

In terms of the impact of social information, our study revealed that individuals exposed to more lenient information tended to cheat more, but this was only the case with normative, not empirical, information. We did not find any causal effect of either type of information on the formation of empirical expectations. Furthermore, while normative expectations remained unaffected by empirical information, they were responsive to exogenously provided normative information.

From that, two findings from our research are particularly noteworthy. First, normative social information exerted a greater influence than empirical social information, contrary to our initial conjectures and the findings of Bicchieri and Xiao (2009), but partially consistent with Bicchieri et al. (2021). This invites further investigation into the conditions under which individuals prioritize empirical social information over prescriptive information. A key implication of this is that policymakers should recognize the importance of influencing normative expectations, potentially through educational programs.

Second, our findings indicate that while normative expectations tend to be resistant to change (sticky) in the Endogenous treatments, they are more responsive to social normative information in the Exogenous treatments, where selection bias is less likely. This suggests that social norms may be more malleable than often assumed, particularly when individuals are not selecting the source of their information. This observation is important for policy and intervention design, as it challenges the common belief about the inherent stickiness of normative expectations. The fact that, in our study, this resistance to change is associated with individuals' choice of information sources suggests that interventions might need to focus on both the type of information provided and how individuals are exposed to it. This could mean creating environments where diverse and unbiased information is more accessible or encouraging exposure to different viewpoints. As discussed by Dimant and Shalvi (2022), changing entrenched social

norms might require more assertive approaches, but understanding the nuances of how individuals acquire and use information is crucial for the effectiveness of these interventions.

Finally, our results showed that although peers' political identification influenced the search for information, it did not affect the impact of social information on behavior or on empirical or normative expectations, once we accounted for selection. This finding presents a contrast to existing literature, which suggests that polarization is often driven by biased social learning among peers (*e.g.*, Centola, 2018; Golman et al., 2022). However, the absence of a significant effect of political identification on behavior and expectations in our experiment might not be entirely unexpected. In our setup, political affiliation did not provide additional information about lying behavior or associated norms. It is possible that in scenarios where group identity offers more pertinent information about prevailing social norms or in contexts where individuals' social image is at stake, partisan information might be treated differently. This lack of impact of political identification on behavior and expectations in our experiment adds to the growing evidence that the influence of partisan differences is highly context-specific. Such differences might play a more pronounced role under certain conditions and in particular settings, as seen in other research (for instance, Hartman et al., 2022; Druckman et al., 2023). This context-specificity of partisan influences is a crucial consideration for understanding social dynamics.

Despite its contributions, our study also has limitations that are worth acknowledging. Although a strong link between norms, lying, and real-world behavior has been established (including cross-culturally, e.g., Gächter and Schulz, 2016; Potters and Stoop, 2016; Cohn et al., 2019; Aycinena et al., 2022), our virtual lying game may not capture the full spectrum of real-world ethical dilemmas that affect how people seek out norm-related information to inform their own behavior and world-view. And because we focused on the U.S. context, the use of political identification as a proxy for group identity may not generalize to other contexts (Bonomi et al., 2021; Boxell et al., 2022; Dorrough et al., 2023). Another limitation of our study might stem from using an online platform for conducting experiments, a common practice in modern research. In our case, this approach could have affected participants' attention levels, particularly in treatments where social information was provided exogenously. Reduced attention in these scenarios might lead to a diminished impact of the social information, potentially causing us to underestimate the significance of peer effects. Furthermore, the emergence of strong conformity effects often requires repeated exposure to similar types of peers. In our experimental design, participants were required to sample from both sources of information to determine which one was associated with more or less lenient attitudes towards lying. This necessity to explore and discern may have limited the extent of conformity effects observed, as participants were not consistently exposed to a single type of peer influence throughout the experiment. Building on our findings, future research could explore the diversity of forms that motivated information acquisition can take in the moral domain. It could also investigate more nuanced aspects of the relationship between information acquisition, group identities, and moral decision-making. For instance, studies could investigate how the content, framing, and presentation of social information affect individual responses in various ethical dilemmas (see, e.g., Dimant et al., 2020), extending beyond our virtual lying game to capture a broader spectrum of real-life situations. Furthermore, researchers could examine the effectiveness of different intervention strategies, such as providing counter-normative information, in altering normative beliefs and inducing more ethical behavior.

Appendix A. Supplementary data

Supplementary material related to this article can be found online at https://doi.org/10.1016/j.euroecorev.2024.104778.

References

Acemoglu, D., Jackson, M.O., 2017. Social norms and the enforcement of laws. J. Eur. Econom. Assoc. 15 (2), 245–295.

Akerlof, G.A., Kranton, R.E., 2000. Economics and identity. Q. J. Econ. 115 (3), 715–753.

Aycinena, D., Rentschler, L., Beranek, B., Schulz, J.F., 2022. Social norms and dishonesty across societies. Proc. Natl. Acad. Sci. 119 (31), e2120138119.

Bäker, A., Mechtel, M., 2019. The impact of peer presence on cheating. Econ. Inq. 57 (2), 792–812.

Bašić, Z., Verrina, E., 2021. Personal Norms—and Not Only Social Norms—Shape Economic Behavior. MPI Collective Goods Discussion Paper.

Benabou, R., Tirole, J., 2011. Identity morals and taboos: beliefs as assets. Q. J. Econ. 126 (2), 805–855.

Benistant, J., Galeotti, F., Villeval, M.C., 2022. Competition, information, and the erosion of morals. J. Econ. Behav. Organ. 204, 148–163.

Bicchieri, C., 2006. The Grammar of Society: The Nature and Dynamics of Social Norms. Cambridge University Press.

Bicchieri, C., Chavez, A., 2010. Behaving as expected: Public information and fairness norms. J. Behav. Decis. Mak. 23 (2), 161–178.

Bicchieri, C., Dimant, E., 2019. Nudging with care: the risks and benefits of social information. Public Choice 1–22.

Bicchieri, C., Dimant, E., 2023. Norm-Nudging: Harnessing Social Expectations for Behavior Change. Working Paper.

Bicchieri, C., Dimant, E., Gächter, S., Nosenzo, D., 2022a. Social proximity and the erosion of norm compliance. Games Econom. Behav. 132, 59–72.

Bicchieri, C., Dimant, E., Gelfand, M., Sonderegger, S., 2022b. Social norms and behavior change: The interdisciplinary research frontier. J. Econ. Behav. Organ..

Bicchieri, C., Dimant, E., Sonderegger, S., 2023. It's not a lie if you believe the norm does not apply: Conditional norm-following and belief distortion. Games Econom. Behav. 138, 321–354.

Bicchieri, C., Dimant, E., Xiao, E., 2021. Deviant or wrong? The effects of norm information on the efficacy of punishment. J. Econ. Behav. Organ. 188, 209–235.

Bicchieri, C., Xiao, E., 2009. Do the right thing: But only if others do so. J. Behav. Decis. Mak. 22 (2), 191–208.

Bonomi, G., Gennaioli, N., Tabellini, G., 2021. Identity, beliefs, and political conflict. Q. J. Econ. 136 (4), 2371–2411.

Boxell, L., Gentzkow, M., Shapiro, J.M., 2022. Cross-country trends in affective polarization. Rev. Econ. Stat. 1–60.

Buhrmester, M.D., Talaifar, S., Gosling, S.D., 2018. An evaluation of amazon's mechanical turk, its rapid rise, and its effective use. Perspect. Psychol. Sci. 13 (2), 149–154.

Bursztyn, L., Egorov, G., Fiorin, S., 2020a. From extreme to mainstream: The erosion of social norms. Amer. Econ. Rev. 110 (11), 3522–3548.

Bursztyn, L., González, A.L., Yanagizawa-Drott, D., 2020b. Misperceived social norms: Women working outside the home in Saudi Arabia. Amer. Econ. Rev. 110 (10), 2997–3029.

Campos, C.F., Hargreaves Heap, S., Leite Lopez de Leon, F., 2017. The political influence of peer groups: experimental evidence in the classroom. Oxf. Econ. Pap. 69 (4), 963–985.

Centola, D., 2018. How Behavior Spreads: The Science of Complex Contagions. Vol. 3, Princeton University Press.
Chang, L.J., Sanfey, A.G., 2013. Great expectations: neural computations underlying the use of social norms in decision-making. Scan 8, 277–284.
Charness, G., Rigotti, L., Rustichini, A., 2007. Individual behavior and group membership. Amer. Econ. Rev. 97 (4), 1340–1352.
Charroin, L., Fortin, B., Villeval, M.C., 2022. Peer effects, self-selection and dishonesty. J. Econ. Behav. Organ. 200, 618–637.
Chen, R., Chen, Y., 2011. The potential of social identity for equilibrium selection. Amer. Econ. Rev. 101 (6), 2562–2589.
Chen, S., Heese, C., 2021. Fishing for Good News: Motivated Information Acquisition. Discussion Paper Series University of Bonn, 224.
Chen, Y., Li, S.X., 2009. Group identity and social preferences. Amer. Econ. Rev. 99 (1), 431–457.
Cialdini, R., 2003. Crafting normative messages to protect the environment. Curr. Dir. Psychol. Sci. 12 (4), 105–109.
Cinelli, M., De Francisci Morales, G., Galeazzi, A., Starnini, M., 2021. The echo chamber effect on social media. Proc. Natl. Acad. Sci. USA 118 (9), e2023301118.
Cohn, A., Fehr, E., Maréchal, M.A., 2014. Business culture and dishonesty in the banking industry. Nature 516 (7529), 86–89.
Cohn, A., Maréchal, M.A., Tannenbaum, D., Zünd, C.L., 2019. Civic honesty around the globe. Science eaau8712.
Currarini, S., Mengel, F., 2016. Identity, homophily and in-group bias. Eur. Econ. Rev. 90, 40–55.
d'Adda, G., Dufwenberg, M., Passarelli, F., Tabellini, G., 2020. Social norms with private values: Theory and experiments. Games Econom. Behav. 124, 288–304.
Dana, J., Weber, R.A., Kuang, J.X., 2007. Exploiting moral wiggle room: experiments demonstrating an illusory preference for fairness. Econom. Theory 33 (1), 67–80.
Dimant, E., 2019. Contagion of pro-and anti-social behavior among peers and the role of social proximity. J. Econ. Psychol. 73, 66–88.
Dimant, E., 2023. Hate trumps Love: The impact of political polarization on social preferences. Manage. Sci..
Dimant, E., Gelfand, M., Hochleitner, A., Sonderegger, S., 2024. Strategic behavior with tight, loose, and polarized norms. Management Science.
Dimant, E., Gesche, T., 2023. Nudging enforcers: How norm perceptions and motives for lying shape sanctions. PNAS Nexus pgad224.
Dimant, E., van Kleef, G.A., Shalvi, S., 2020. Requiem for a nudge: Framing effects in nudging honesty. J. Econ. Behav. Organ. 172, 247–266.
Dimant, E., Shalvi, S., 2022. Meta-nudging honesty: Past, present, and future of the research frontier. Curr. Opin. Psychol. 101426.
Dixit, A.K., Weibull, J.W., 2007. Political polarization. Proc. Natl. Acad. Sci. 104 (18), 7351–7356.
Dorrough, A.R., Köbis, N., Irlenbusch, B., Shalvi, S., Glöckner, A., 2023. Conditional bribery: Insights from incentivized experiments across 18 nations. Proc. Natl. Acad. Sci. 120 (18), e2209731120.
Douglas, B.D., Ewell, P.J., Brauer, M., 2023. Data quality in online human-subjects research: Comparisons between MTurk, prolific, CloudResearch, qualtrics, and SONA. PLoS ONE 18 (3), e0279720.
Druckman, J.N., Kang, S., Chu, J., Willer, R., 2023. Correcting misperceptions of out-partisans decreases American legislators' support for undemocratic practices. Proc. Natl. Acad. Sci. USA 120 (23), e2301836120.
Efferson, C., Lalive, R., Fehr, E., 2008. The coevolution of cultural groups and ingroup favoritism. Science 321 (5897), 1844–1849.
Fehr, E., Schurtenberger, I., 2018. Normative foundations of human cooperation. Nat. Hum. Behav. 2 (7), 458–468.
Fischbacher, U., Föllmi-Heusi, F., 2013. Lies in disguise—an experimental study on cheating. J. Eur. Econom. Assoc. 11 (3), 525–547.
Flashman, J., Gambetta, D., 2014. Thick as thieves: Homophily and trust among deviants. Ration. Soc. 26 (1), 3–45.
Flaxman, S., Sharad, G., Rao, J.M., 2016. Filter bubbles, echo chambers and online news consumption. Public Opin. Q. 80, 298–320.
Fortin, B., Lacroix, G., Villeval, M.-C., 2007. Tax evasion and social interactions. J. Public Econ. 91 (11), 2089–2112.
Gächter, S., Schulz, J.F., 2016. Intrinsic honesty and the prevalence of rule violations across societies. Nature 531 (7595), 496–499.
Galeotti, F., Saucet, C., Villeval, M.C., 2020. Unethical amnesia responds more to instrumental than to hedonic motives. Proc. Natl. Acad. Sci. USA 202011291.
Gavrilova, E., 2019. A partner in crime: Assortative matching and bias in the crime market. J. Econ. Behav. Organ. 159(C), 598–612.
Gelfand, M., Li, R., Stamkou, E., Pieper, D., Denison, E., Fernandez, J., Choi, V., Chatman, J., Jackson, J., Dimant, E., 2022. Persuading republicans and democrats to comply with mask wearing: An intervention tournament. J. Exp. Soc. Psychol. 101, 104299.
Goette, L., Huffman, D., Meier, S., 2006. The impact of group membership on cooperation and norm enforcement: evidence using random assignment to real social groups. Amer. Econ. Rev. 96 (2), 212–216.
Goldstein, N.J., Cialdini, R.B., Griskevicius, V., 2008. A room with a viewpoint: Using social norms to motivate environmental conservation in hotels. J. Consum. Res. 35 (3), 472–482.
Golman, R., Loewenstein, G., Molnar, A., Saccardo, S., 2022. The demand for, and avoidance of, information. Manage. Sci. 68 (9), 6454–6476.
Grossman, Z., van der Weele, J.J., 2017. Self-image and willful ignorance in social decisions. J. Eur. Econom. Assoc. 15 (1), 173–217.
Hara, K., Adams, A., Milland, K., Savage, S., Callison-Burch, C., Bigham, J.P., 2018. A data-driven analysis of workers' earnings on amazon mechanical turk. In: Proceedings of the 2018 CHI Conference on Human Factors in Computing Systems. ACM, p. 449.
Hartman, R., Blakey, W., Womick, J., Bail, C., Finkel, E.J., Han, H., Sarrouf, J., Schroeder, J., Sheeran, P., van Bavel, J.J., Willer, R., Gray, K., 2022. Interventions to reduce partisan animosity. Nat. Hum. Behav. 6, 1194–1205.
Haynie, D.L., 2001. Delinquent peers revisited: Does network structure matter? Am. J. Sociol. 106 (4), 1013–1057.
Hobolt, S.B., Lawall, K., Tilley, J., 2023. The polarizing effect of partisan echo chambers. Am. Political Sci. Rev. 1–16.
Jiang, T., 2013. Cheating in mind games: The subtlety of rules matters. J. Econ. Behav. Organ. 93, 328–336.
Kajackaite, A., Gneezy, U., 2017. Incentives and cheating. Games Econom. Behav. 102, 433–444.
Kimbrough, E.O., Vostroknutov, A., 2016. Norms make preferences social. J. Eur. Econom. Assoc. 14 (3), 608–638.
Klein, E., 2020. Why We're Polarized. Avid Reader Press / Simon & Schuster.
Kroher, M., Wolbring, T., 2015. Social control, social learning, and cheating: Evidence from lab and online experiments on dishonesty. Soc. Sci. Res. 53, 311–324.
Krupka, E.L., Weber, R.A., 2013. Identifying social norms using coordination games: Why does dictator dame sharing vary? J. Eur. Econom. Assoc. 11 (3), 495–524.
Levy, R., 2021. Social media, news consumption, and polarization: evidence from a field experiment. Amer. Econ. Rev. 111 (3), 831–870.
Li, S.X., 2020. Group identity, ingroup favoritism, and discrimination. In: Zimmermann, K. (Ed.), Handbook of Labor, Human Resources and Population Economics. Springer.
Merguei, N., Strobel, M., Vostroknutov, A., 2020. Moral Opportunism and Excess in Punishment Decisions. Mimeo Maastricht University.
Nyhan, B., Settle, J., Thorson, E., Wojcieszak, M., Barberá, P., Chen, A.Y., Allcott, H., Brown, T., Crespo-Tenorio, A., Dimmery, D., Freelon, D., . . ., Tucker, J.A., 2023. Like-minded sources on facebook are prevalent but not polarizing. Nature 620, 137–144.
Ostrom, E., 2000. Collective action and the evolution of social norms. J. Econ. Perspect. 14 (3), 137–158.
Posner, E., 2000. Law and social norms: The case of tax compliance. Va. Law Rev. (Symp. Leg. Constr. Norms) 86, 1781–1819.
Potters, J., Stoop, J., 2016. Do cheaters in the lab also cheat in the field? Eur. Econ. Rev. 87, 26–33.
Rauhut, H., 2013. Beliefs about lying and spreading of dishonesty: Undetected lies and their constructive and destructive social dynamics in dice experiments. PLoS One 8 (11), e77878.
Ross Arguedas, A., Robertson, C., Fletcher, R., Nielsen, R., 2022. Echo Chambers, Filter Bubbles, and Polarisation: A Literature Review. Reuters Institute for the Study of Journalism.
Schultz, P.W., Nolan, J.M., Cialdini, R.B., Goldstein, N.J., Griskevicius, V., 2007. The constructive, destructive, and reconstructive power of social norms. Psychol. Sci. 18 (5), 429–434.
Sharot, T., Sunstein, C.R., 2020. How people decide what they want to know. Nat. Hum. Behav. 1–6.
Smerdon, D., Offerman, T., Gneezy, U., 2020. 'Everybody's doing it': on the persistence of bad social norms. Exp. Econ. 23, 392–420.
Soraperra, I., van der Weele, J., Villeval, M., Shalvi, S., 2023. The social construction of ignorance: Experimental evidence. Games Econom. Behav. 138, 197–213.
Spiekermann, K., Weiss, A., 2016. Objective and subjective compliance: A norm-based explanation of 'moral wiggle room'. Games Econom. Behav. 96, 170–183.
Törnberg, P., 2022. How digital media drive affective polarization through partisan sorting. Proc. Natl. Acad. Sci. USA 119 (42), e2207159119.
Villeval, M.C., 2020. Public goods, norms and cooperation. In: Capra, C.M., Croson, R., Rigdon, M., Rosenblat, T. (Eds.), Handbook of Experimental Game Theory. Edward Elgar Publishing, Cheltenham, pp. 184–212.