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# Absolute groupishness and the demand for information

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## Abstract

Does social identity affect how decision makers consume and digest new information? We study this question through a theoretically informed experiment, employing a variant of the sender receiver game in which receivers can purchase reports from up to two senders. Depending on senders' preferences for truth-telling, reports are either informative or not. In the baseline condition of our experiment, receivers observe senders' incentives for reporting truthfully. In the treatment condition receivers additionally observe whether they share a group identity with the sender. Group identities are induced via a standard minimal group paradigm. We find that senders behave in line with a model that assumes senders incur a positive lying cost. Making social identity observable significantly affects information acquisition and makes receivers more prone to ignore potentially informative outgroup reports. This is especially the case when outgroup senders have higher incentives for truth-telling. This change in information acquisition has implications for optimal decision making: it negatively affects receivers' ability to correctly infer the true state of world.

*Keywords: Misinformation, Social Identity, Sender-Receiver Game, Fake News, Information*

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# 1 Introduction

Information plays a fundamental role in optimisation decisions, placing it at the heart of economics. Economic decision makers should prefer acquiring more information to less, and acquiring higher quality information over lower quality information. However, the conjecture that more, higher quality information is always preferred to less or lower quality information has been repeatedly called into question, both in the experimental laboratory and in the field (Hertwig and Engel, 2016; Golman et al., 2017). Information avoidance is commonplace; and even when information is sought out, it is sometimes selected from sources of dubious quality.<sup>1</sup>

When decision makers can choose between competing information sources (such as different media outlets, financial advisers, or political commentators) there is increasing concern that they will seek out low quality or biased information. This mirrors wider concerns that we live through an age of disinformation, characterised by “fake news”, click-bait headlines, media bias, and a preference for rumours and strongly held opinions rather than expert judgements based on evidence (Gentzkow and Shapiro, 2006; Allcott and Gentzkow, 2017). For instance, in the run up to the 2016 US presidential election, fake news stories were shared 38 million times through social media channels; and in the month before the election, American voters visited fake news websites, on which more than half of the content is considered false, 159 million times (Allcott and Gentzkow, 2017). Actively seeking out this sort of low quality and therefore potentially misleading information might harm decision makers’ ability to make optimal decisions.

Why do some decision makers avoid potentially relevant information, and why do others seek out information of low quality when higher quality information is available at low cost or no cost at all? One possibility is that in many situations studied by economists, the quality of an information piece is not straightforwardly determined. Instead, decision makers need to form beliefs about the truthfulness and reliability of information, especially when sharing misinformation brings a strategic advantage, or even direct reward, to those holding private information (Crawford and Sobel, 1982; Kartik, 2009).<sup>2</sup> We propose that the perceived truthfulness of an information source could contribute to the likelihood that it is sought out. Perceptions of truthfulness are subjective and hence not necessarily aligned with objective indicators of information quality. It is thus important to understand the factors that might influence subjective judgements of the truthfulness of different information sources, and how these subjective judgements influence information acquisition decisions and subsequent behaviour. In this study, we explore whether group identity is one channel through which subjective assessments of truthfulness are influenced.

We address this question through a theoretically informed laboratory experiment designed to

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<sup>1</sup>The comprehensive review by Golman et al. (2017) covers a breadth of evidence and explanations related to the avoidance of information. Evidence ranges from the empirical (e.g. Oster et al., 2013; Ganguly and Tasoff, 2016) to the theoretical (e.g. Caplin and Leahy, 2001, 2004; Kőszegi, 2006).

<sup>2</sup>Although lying is less common in such situations than basic economic theory would suggest, information sources may still differ in their truthfulness (Abeler et al., 2019). This observation is supported by a large literature using a variety of experimental paradigms to study lying behaviour (Gneezy, 2005; Fischbacher and Föllmi-Heusi, 2013; Dufwenberg and Dufwenberg, 2018).

understand the role of group identity in influencing judgements about truthfulness, where those judgements might drive decisions to acquire information from sources of varying quality. In our experiment, decision makers can acquire instrumental information from two competing sources: one ingroup source and one outgroup source. Our design furthermore rules out several rival explanations for sub-optimal information acquisition decisions that have been discussed in previous studies. In particular, given the type of information in our experiment (the colour of a ball), decision makers should have no preferences over its content.<sup>3</sup>

One simple reason why decision makers may prefer lower quality over higher quality information is that the expected benefits from consuming high quality information may not outweigh the costs associated with its acquisition. This explanation, which follows from basic rational choice considerations (Gollier, 2004), assumes that the benefits and costs of information are a function of its quality. Group identity could affect this calculus, if decision makers judge the truthfulness of information differently depending on whether they share a group affiliation with its source. Economists increasingly recognise that the affiliation and identification with a social group leads individuals to treat or view members from this group (their ingroup) differently than members of other groups to which they do not belong (their outgroup)(Akerlof and Kranton, 2000; Chen and Li, 2009).<sup>4</sup> In line with this observation, it is conceivable that information from an ingroup member is judged as more truthful than information from an outgroup member.

There are two potential channels through which groupishness may lead to greater trust in information supplied by an ingroup than by an outgroup member. First, decision makers could believe that ingroup members are generally less prone to mislead others, regardless of who the recipients of their information will be. Reasoning along these lines would suggest “They wouldn’t lie to anyone, because they are like me”. We term this favourable view of an ingroup member’s traits as ‘absolute groupishness’. Second, decision makers may assume that those in their ingroup are more likely to provide high quality information to members of their own group, either through exerting higher effort in ensuring the information they provide is true when interacting with a member of their own ingroup, or through a lower propensity to lie to an ingroup member. Here, the reasoning can be captured as “They wouldn’t lie to me, because I am like them”. We refer to this second channel as ‘reciprocity based groupishness’.<sup>5</sup>

While reciprocity based groupishness has been studied before in the context of supplying truthful information to ingroup members (Feldhaus et al., 2014), we believe that absolute groupishness is an underexplored channel. For example, in high stakes political and social arenas, claims of dubious quality are commonplace, yet people seek out information about these claims and occa-

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<sup>3</sup>The abstract nature of information excludes that consuming it from certain sources would have direct consumption benefits or would help decision makers to confirm their prior or motivated beliefs (e.g., Charness et al., 2019; Ditto and Lopez, 1992; Gentzkow and Shapiro, 2006; Gentzkow et al., 2018; Zimmermann et al., 2019; Epley and Gilovich, 2016; Bénabou, 2015, ). In the Discussion section, we expand on how our contribution is distinct from this literature.

<sup>4</sup>For instance, in a trust game experiment, participants with artificially induced minimal group identities have been found to trust ingroup members more than outgroup members (Hargreaves Heap and Zizzo, 2009). Similarly, Chen and Li (2009) report that experimental participants behave more kindly towards ingroup members than outgroup members even when group affiliations were randomly assigned at the beginning of the experiment.

<sup>5</sup>Either channel could also apply to outgroup members: “They are more likely to lie because they are not like me” or “they are more likely to lie to me because I am not like them”.

sionally act upon them.<sup>6</sup> Especially in traditional media, messages are often broadcast widely without being targeted based on recipients’ group identities. In these forms of communication, there is thus a limited role for ‘reciprocity based groupishness’.

To study the role of absolute groupishness in information acquisition decisions, our experiment holds constant the main features of an information selection environment that could predict a preference for low quality information under standard economic assumptions by making high and low quality information equally available and affordable to our participants. We modify a well-established experimental paradigm - the sender-receiver game - introduced in theory by Crawford and Sobel (1982) and put into experimental practice by Gneezy (2005). Our version involves two senders who are informed about the same true state of the world. Senders can either report the true state of the world to a receiver, or they can lie. Whereas the existing literature on sender receiver games has almost exclusively focused on the sender’s decision whether or not to deceive the receiver, in this paper we are concerned with the receivers’ decisions to consume reports from a given sender or not. For this reason, in the main part of our experiment, reports are not automatically revealed to receivers but need to be purchased.<sup>7</sup>

We experimentally manipulate senders’ objective lying costs by varying the payoff they receive from reporting truthfully and we make these payoffs known to receivers. Receivers are thereby given an objective criterion by which they can form beliefs about the relative truthfulness of two reports.<sup>8</sup> By experimentally inducing group identity, following the procedures described in Chen and Li (2009), we rule out home-grown assumptions about the quality or truthfulness of reports from ingroup and outgroup members based on what defines the group. This allows us to test a specific channel through which a preference for low quality news may occur: whether the source of the information is an ingroup or an outgroup member.

We further explore an angle of group preference that has received surprisingly little attention to date: the distinction between ingroup favouritism and outgroup disfavouritism. That is, do people seek out information from ingroup members because they have positive absolute groupishness towards them? Alternatively, do people actively avoid information from members of their outgroup, reflecting negative groupishness towards outsiders? To our knowledge, ours is the first experiment to separate group preferences along the two dimensions of absolute vs reciprocity based groupishness, and ingroup favouritism vs outgroup disfavouritism.<sup>9</sup>

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<sup>6</sup>A striking current example is the rise in prescriptions of the drug hydroxychloroquine in the US after President Trump endorsed it as a treatment for COVID-19, despite a lack of medical evidence in support of this claim and potentially harmful side effects (Vaduganathan et al., 2020). More troubling still was the need for urgent advice against inhaling bleach, again following the President’s misleading comments (Yamey and Gonsalves, 2020)

<sup>7</sup>To reduce the complexity of the game and prevent second order beliefs from influencing the information acquisition decision, we make senders’ payoffs independent from the actions of receivers. This parallels a situation where a politician cares about the statements he makes publicly but not about the actions that may follow from his statements.

<sup>8</sup>The abstract information setting we employ minimises the concern that motivated reasoning may affect information acquisition choices. Motivated reasoning requires receivers to care about the content of the information acquired, since it may help them to maintain or strengthen the beliefs they hold about themselves or the world. This tendency can also manifest in the form of confirmation bias. We note that confirmation bias does not depend on any specific prior preference for a given state of the world, only a prior belief that the state is true, e.g. Charness and Dave (2017).

<sup>9</sup>There is a large literature on cooperation and conflict that distinguishes between ‘ingroup love’ and ‘outgroup hate’ along the same lines we use here (Brewer, 1999; Weisel and Böhm, 2015) but it does not distinguish between

In what follows, we present a theoretically informed lab experiment that identifies the role of ‘absolute groupishness’ in the selection of information and we find strong evidence in favour of this hypothesis. The rest of the paper is structured as follows. Section 2 outlines the theoretical framework that underlies our experimental design and definition of absolute groupishness, Section 3 describes our experimental methodology, Section 4 provides an account of our results, and Section 5 concludes.

## 2 Theoretical Framework

Our theoretical framework, based on a simplified version of the sender-receiver game, illustrates how receivers’ trust in and demand for information could depend on senders’ incentives for truth-telling as well as a shared group affiliation among receivers and senders. To this aim, we deviate from a standard sender-receiver game (Crawford and Sobel, 1982) in three major ways. First, as in Gneezy et al. (2013), we simplify the payoff structure such that senders’ payoffs only depend on their own actions and not on the actions chosen by receivers. Second, in our theoretical analysis we allow for the possibility that senders may receive disutility from lying, and this psychological cost may or may not outweigh the material benefits from lying. This assumption reflects current evidence and models on preferences for lying (Abeler et al., 2019). Third, we make changes to the game structure that allow us to model endogenous information choices made by receivers. In this new structure, each receiver is paired with two senders and chooses whether to purchase reports from one, both, or neither of them. In a preliminary stage, we focus on the usual sender-receiver game with a single sender and with receivers automatically seeing the sender’s report at no cost. From this stage, we derive baseline predictions for senders with and without psychological lying costs. We then modify this environment to include two senders and endogenous information choices.

### 2.1 Basic Setup

There is a set of two players  $N = S, R$ ; a sender ( $S$ , “she”) and a receiver ( $R$ , “he”). The binary state space  $\Omega$  contains two possible elements (b for blue and o for orange). The true state of the world  $\omega \in \{\omega_b, \omega_o\}$  is drawn from  $\Omega$  and automatically revealed in private to the sender, with  $p_b$  denoting the commonly known (prior) probability that the true state is  $\omega_b$ .

$S$  moves first, observes  $\omega$ , and then decides which state from her message space  $r \in \{r_b, r_o\}$  to report to  $R$ . Contrary to standard sender-receiver games (Crawford and Sobel, 1982), the sender’s payoff only depends on the content of her report with  $\pi_b$  and  $\pi_o$  denoting the monetary payoffs corresponding to each type of content. We will call a sender unbiased if  $\pi_b = \pi_o$  and biased if  $\pi_b > \pi_o$ .<sup>10</sup>

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absolute versus reciprocity-based groupishness.

<sup>10</sup>For simplicity, we will restrict ourselves to cases where senders are biased towards reporting  $r_b$ , i.e. when  $\pi_b > \pi_o$ . All results hold with symmetry when instead senders are instead biased towards reporting  $r_o$ .

R moves second. After observing a report,  $R$  submits a guess  $G \in \{o, b\}$  as to the true state of the world. If the guess and the true state of the world coincide ( $\omega = G$ ) he earns a monetary payoff of  $\Pi > 0$ ; if there is a mismatch he earns nothing.

Figure 7 in the appendix displays the basic structure of this game in extensive form.

## 2.2 Benchmark: Senders without and with lying costs

We start with some simple benchmark predictions that come from a setting where both S and R are exclusively motivated by maximising their monetary payoffs from the game. Here, if S is minimally biased such that  $\pi_b > \pi_o$ , sending  $r_b$  in all cases is a strictly dominant strategy and the reports are therefore uninformative (i.e.  $p(r_b|\omega_b) = p(r_b|\omega_o) = 1$ ); hence, a payoff-maximising R should guess the more likely outcome according to his prior beliefs determined by the common prior  $p_b$ .

**Proposition 1:** *Without lying costs, a biased sender will always send  $r_b$ . The receiver will follow this report only if  $p_b > 0.5$ . This holds independently from the size of the bias as long as  $\Pi > 0$ .*

We next introduce the possibility that senders are averse to lying, following a recent literature which has established that S might face a psychological cost from providing a report that does not reflect the true state of the world (Dufwenberg and Dufwenberg, 2018; Gneezy et al., 2018; Abeler et al., 2019).<sup>11</sup> Following Abeler et al. (2019), let the following generic utility function capture the material benefits and psychological lying costs faced by senders:

$$\phi(r, \omega, t_i) = \pi_r - t_i c(r, \omega) \tag{1}$$

where  $t_i$  reflects the individual lying cost distributed uniformly on  $[0, T_{max}]$ .<sup>12</sup> Furthermore,  $c(r, \omega)$  is an indicator function taking a value of 0 if  $r = \omega$  and 1 otherwise. As before, biased senders will always report truthfully if  $\omega = \omega_b$ . With positive lying costs and  $\omega = \omega_o$ , senders will report truthfully if and only if the monetary benefits from lying are smaller than the psychological costs.

**Proposition 2:** *If  $\omega = \omega_o$  the propensity that a biased sender tells a lie is always positive and increases with the size of senders' bias (i.e.  $\pi_b - \pi_o$ ).*

Proposition 2 follows directly from the assumptions regarding the utility function and the distribution of  $t_i$  (see Appendix ??).

Given that reports from S can be truthful (i.e.  $p(r_b|\omega_o) < 1$ ), receivers update their beliefs

<sup>11</sup>Such psychological costs might reflect but not be limited to self image concerns, social image concerns or reputational concerns.

<sup>12</sup>For simplicity, we assume that  $T_{max} = \pi_b$  i.e. that the maximum cost from lying is such that it outweighs all material benefits.

according to the report and the (observable) strength of the sender’s bias and choose according to their posterior beliefs.

**Proposition 3:** *If  $\omega_b$  is the more likely state of the world the receiver will always follow the report of the sender independent from the strength of the sender’s bias. If  $\omega_b$  is the less likely state of the world receivers’ choices will be determined by the size of the bias (i.e.  $\pi_b - \pi_o$ ) and  $p_b$ .*

### 2.3 Senders with lying costs and receivers with identity concerns

In this section, we explore how a common group affiliation between senders and receivers could affect receivers’ trust in senders’ reports. We will assume that a shared group affiliation will change receivers’ perception of the lying cost of the sender. This is the idea of ‘absolute groupishness’ as outlined in the introduction i.e. the idea that receivers will assume that lying is relatively more costly to an ingroup than an outgroup member because they view an ingroup member more positively. In particular, we will assume that the lying costs of an outgroup sender will be perceived as smaller than the lying costs of an ingroup sender. To do so we scale the (perceived) lying cost in the senders’ utility function,

$$\phi(r, \omega, t_i) = \pi_r - \theta t_i c(r, \omega) \tag{2}$$

where  $\theta = 1$  when the sender and the receiver share a group affiliation and  $0 < \theta < 1$  when senders and receivers do not share a group affiliation.

**Proposition 4:** Senders perceive the likelihood of receiving a truthful report from an outgroup member as strictly smaller than receiving a truthful report from an ingroup member.



### 3 Design

Our experiment is designed to test basic predictions of the sender-receiver model outlined above, evaluate the role of group identity in information acquisition decisions, and identify the effect of absolute groupishness on overall payoffs. It also allows us to disentangle ingroup favouritism from outgroup disfavoritism.

There are three consecutive experimental stages: a two-player modified sender-receiver game without differentiation by group identity consisting of 12 independent decision rounds; a group affiliation stage in which group identities are induced using a standard group identity paradigm; and 12 independent rounds of a modified sender-receiver game in which each receiver is paired with two senders and each sender with two receivers. Participants are randomised into the treatment or control group before entering stage 3: the group identity of senders is observable to receivers in the treatment group, whilst it is not observable in the control group. Receivers' group identity is never observable to senders, and this is common knowledge. This allows us to clearly identify the role of 'absolute groupishness' separately from 'reciprocity based groupishness'. All participants complete all three stages. At the end of the experiment, one round from either stage 1 or stage 3 is randomly selected for payoff, minimising opportunities for hedging or other behavioural spillovers across rounds or stages.

#### 3.1 Stage 1: one sender, one receiver

In the first stage, participants make decisions in a two-player sender-receiver game resembling the basic design of Gneezy et al. (2013). A game tree summarising its basic structure is shown in figure 7 of the appendix. At the beginning of the experiment, participants are randomly assigned to the role of sender or receiver and they remain in that role throughout the experiment.

All twelve rounds of stage 1 progress in the following way. At the beginning of the round, the true state of the world (blue or orange) is randomly determined according to the commonly known probability distribution. Senders learn the true state of the world and then decide whether to send a blue or an orange report to the receiver they are paired with in this round. Their chosen report is automatically revealed to receivers, and then receivers decide whether to bet on the blue or the orange state of the world.

Since this experiment is mainly concerned with the behaviour of receivers, we can simplify senders' incentives compared to the classic sender-receiver game introduced in Crawford and Sobel (1982). In particular, should a round be payoff-relevant at the end of the experiment, the senders' payoffs depend only on the reports they send and do not depend on the receivers' actions. This eliminates the role of second order beliefs that would complicate the analysis of receiver (and sender) behaviour. As in standard sender-receiver games, receivers are paid according to whether they correctly guess the true state of the world. The amount they receive for a correct guess is the same in both states (£10). Importantly, there is no feedback between rounds and

sender-receiver pairs are re-matched after each round. This minimises receivers’ ability to infer any individual sender’s propensity for truth-telling from their behaviour in previous rounds.

Independent from the true state of the world, senders receive a fixed reward for sending a blue report (£10) in each round. The rewards for sending an orange report are always less than the rewards for sending a blue report. The orange report reward varies by round, being either small (£2), medium (£5), or large (£8). This provides the incentive for a sender to lie, and varies the strength of this incentive between rounds. Rounds also vary in terms of the probability with which the true state of the world is blue. In nine rounds blue is the less probable state of the world ( $p_b = (0.1, 0.3, 0.4)$ ). In three control rounds blue is the more likely state of the world ( $p_b = (0.6)$ ). All unique combinations of these parameters form the 12 rounds of stage 1. To control for potential order effects, the 12 rounds occur in a different order across sessions. Specifically, we had four experimental orders, which governed the order in which senders encountered the high, medium and low payoffs for sending an orange report. Randomisation into orders happened at the session level. The left hand column of Table 1 gives the four orders for stage 1.

**Table 1:** Order Conditions in Stage 1 and Stage 3

	Stage 1	Stage 3
	Sender Payoff Orange	[Senders’ payoffs orange]
Order 1	2, 5, 8, 8, 2, 5, 5, 2, 8, 5, 8, 2	[2,2], [5,5], [2,5], [8,8], [8,2], [5,8]
Order 2	8, 2, 5, 5, 8, 2, 8, 5, 2, 2, 5, 8	[8,5], [2,8], [8,8], [5,2], [5,5], [2,2]
Order 3	5, 8, 2, 2, 5, 8, 2, 8, 5, 8, 2, 5	[8,8], [5,5], [8,2], [5,8], [2,2], [2,5]
Order 4	2, 8, 5, 8, 5, 2, 5, 8, 2, 5, 2, 8	[5,2], [2,2], [8,5], [2,8], [5,5], [8,8]

Stage 3 pattern repeated to give 12 rounds. Numbers represent payoff to sender from sending the orange report. The higher the payoff, the lower the bias. In column 3, the payoffs are assigned randomly between the ingroup and outgroup senders

The parameters that vary in Stage 1 allow us to validate a core assumption of our behavioural model: the existence of positive lying costs (for a recent meta-analysis see Abeler et al. (2019)). In the absence of lying costs, senders would not react to changes in rewards for sending the orange report. Similarly, if receivers did not expect senders to have positive lying costs they would condition their guesses only on the prior probabilities and not on senders’ reports.

### 3.2 Stage 2: group affiliation manipulation

The main question of the paper is whether (minimal) group identity affects information acquisition decisions in stage 3 by influencing trust in information sources. The effect of group identity on economic behaviour has been studied both in naturally occurring (e.g. Goette et al., 2006;

Bernhard et al., 2006; Gallier et al., 2019) and artificially created (minimal) groups (e.g. Eckel and Grossman, 2005; Charness et al., 2007; Chen and Li, 2009). While the former approach provides a comprehensive perspective on all aspects that typically define real groups, the latter approach provides full control over the group formation process and hence by design minimises concerns that effects could arise from selection into natural groups (Goette et al., 2012). For the purpose of this paper we adopt the minimal group approach pioneered by Turner and Tajfel (1986).

To artificially create group identity in the laboratory we closely follow the procedures that are described in Chen and Li (2009). Specifically, after finishing stage 1, participants were randomly allocated to one of two groups, arbitrarily labelled ‘Diamonds’ or ‘Spades’. Next, they were shown pictures by the artists Klee and Kandinsky and could familiarise themselves with the painting styles of both artists. We implemented the group formation phase as follows. Participants had to guess whether Klee or Kandinsky painted two further pictures that were displayed on the screen. Using a chat box, they could confer with other members of their own group but not with members of the other group.<sup>13</sup> After the discussion, they individually guessed the painter of each picture, earning a bonus payment of £0.50 for each correct guess. Participants learned whether they guessed correctly or not at the end of the whole experiment. Moreover, in the third stage of the experiment, senders could never identify the group affiliation of receivers and this was common knowledge. Therefore, senders could not reciprocate any help from the receivers they encountered in the group task.

### 3.3 Stage 3: Two senders, two receivers

Stage 3 is a modified sender-receiver game in which each sender is matched with two receivers and each receiver is matched with two senders. For senders, all 12 rounds of the decision task closely resemble task 1. At the beginning of a round they learn the true state of the world and then have to decide whether to send a blue or an orange report to each of the two receivers they are matched with in this round. They can send the same report or different reports to the two receivers. They know that in each round they might be paid according to one of the two reports they send, with blue reports offering higher rewards than orange reports. In neither the baseline nor the treatment condition can they identify the group affiliation of the receiver. The receivers are simply presented to senders as B1 and B2.

Just as in stage 1, receivers are paid £10 for correctly guessing the state of the world and £0 otherwise. To study the effect of groupishness on the demand for information, we make three important changes to the receiver’s task compared with stage 1. First, receivers are now matched with two different senders. Each of these senders provides a report about the same state of the world but they may have different incentives for sending an orange report. Therefore, when

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<sup>13</sup>The chat was free-form so subjects could exchange any sort of information. Chat protocols show that conversations focused almost exclusively on the task. Importantly, the rules of stage 3 were only revealed after the group formation task so no details about the subsequent stage could be exchanged.

the state of the world is orange, senders with positive lying costs can have differently strong incentives to misreport a blue state. Receivers can observe these incentives in both the baseline (group identity hidden) and treatment (group identity revealed) conditions because they are shown the senders' payoffs from sending an orange or a blue report. Second, reports are not revealed automatically but instead receivers need to decide whether to purchase reports. They can either purchase one report from their preferred sender, two reports (one from each sender), or they can decide not to purchase any reports at all. Each report costs £0.20 and all purchased reports are revealed simultaneously. Thus, receivers cannot condition their decision to purchase a second report on the content of the first report. Third, in the treatment condition only, receivers can observe the group affiliations of the two senders.

In each round, receivers are paired with one sender from their ingroup and one sender from their outgroup. The incentives for sending an orange report vary for each sender in each round. In some rounds both ingroup and outgroup senders have the same incentives, while in other rounds the ingroup sender receives a lower (higher) payoff for sending an orange report. These combinations are balanced such that in six rounds both senders have the same incentives and in the remaining six rounds the incentives to send an orange report differed between the senders. Again, four main orders were included, differentiated by the order with which senders with different incentives were encountered. The rightmost column of Table 1 gives the order combinations. For example, if a receiver is assigned to Order 2, and if their ingroup sender was assigned the £8 reward for sending an orange signal (with the outgroup sender correspondingly assigned £5 for sending an orange signal), then their ingroup sender had a low incentive to misreport (receiving £8) and the outgroup sender had medium bias (receiving £5). If instead their ingroup sender was assigned the £5 payoff and the outgroup sender assigned £8, then their ingroup sender had medium bias and their outgroup sender had low bias. By randomising the participants into groups, and randomising which sender faced which bias, this ensures that there is a balance between ingroup and outgroup senders.

Jointly, these adaptations allow us to understand how receivers acquire and process information depending on (i) senders' objective incentives for reporting truthfully and (ii) a shared group affiliation that is observable to receivers in the treatment condition but not in the baseline.

### 3.4 Procedures and implementation

The experiment and all instructions were fully computerized using z-Tree (Fischbacher, 2007). In the Spring of 2019, we recruited 136 student participants to participate in one of 10 sessions (Five baseline sessions: N=68; Five treatment sessions: N=68). Participants were recruited from the regular subject pool at the BEEL lab of the University of Birmingham using ORSEE (Greiner, 2015). Our sampling, hypotheses, and subsequent analyses follow a pre-registered plan that can be found at (<https://osf.io/5yjpg/>). After the experiment, participants were asked to complete a short questionnaire and received their cash payment from one randomly selected round from either stage 1 or stage 3 in addition to their bonus payment from stage 2. The

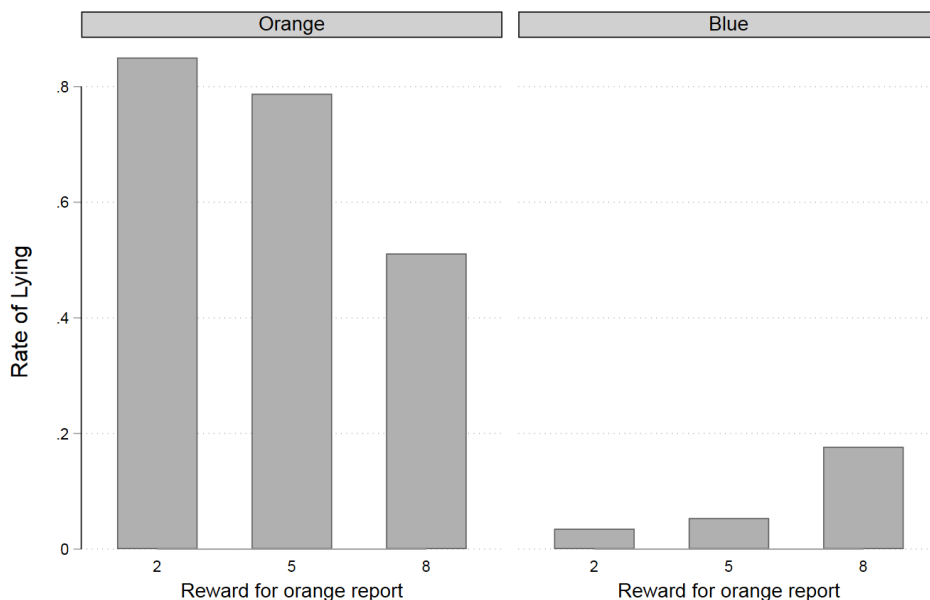
mean take-home payment was £11.74, the minimum was £2.50 and the maximum was £14.50, including a £2.50 show-up fee.

## 4 Results

### 4.1 Lying and Following in Stage 1

Our analysis of senders' and receivers' behaviour in stage 1 establishes two results, each of which validates a core assumption of our theoretical framework.

**Figure 1:** Share of untruthful reports by state of the world and costs of truth-telling.



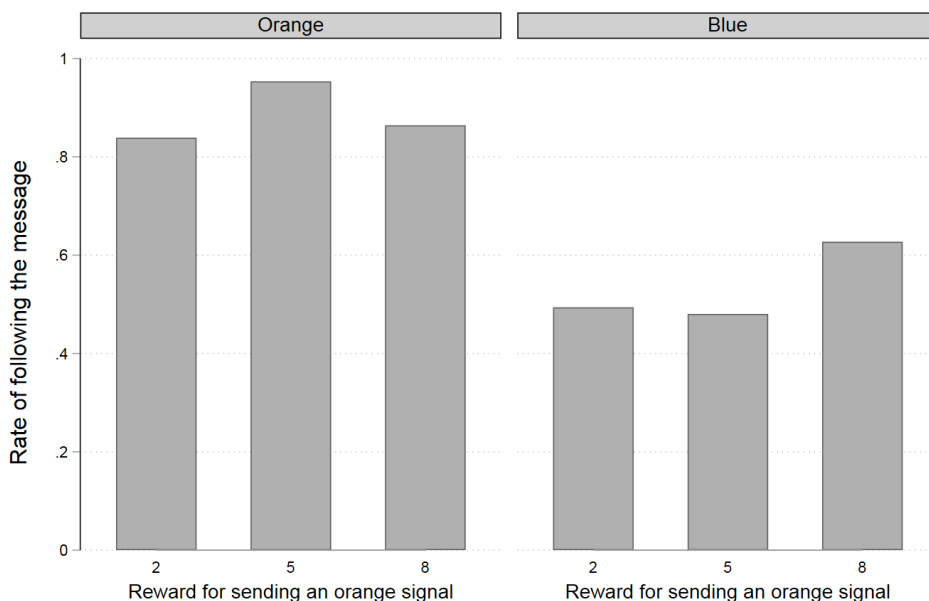
*The left panel shows lying rates when the state of the world is orange. Here, the higher the reward for reporting orange, the lower the costs of truth telling when the state of the world is orange. The right panel shows lying rates when the state of the world is blue, where truthfully reporting blue is a payoff maximising strategy regardless of the payment for reporting orange.*

First, in line with some senders facing positive lying costs, misreporting is not ubiquitous.<sup>14</sup> Instead, lying is a function of the strength of senders' induced bias towards reporting blue. Figure 1 summarises the frequency of untruthful reports by the revealed state of the world and by the rewards that senders receive for sending an orange report. The left panel shows the frequency of misreporting when there are monetary benefits from such behaviour (i.e. sending a blue report despite observing an orange state). When the benefits from reporting the observed state of the world truthfully are low, lying is widespread. When the benefits of reporting it truthfully are at their highest level (£8), lying is still common but significantly less so than

<sup>14</sup>A binomial probability test rejects the hypothesis that senders only send blue reports ( $p < 0.001$ ).

when the benefits of reporting truthfully were at their lowest level (£2) (85% vs 51%; Chi2 Test,  $p < 0.001$ ).<sup>15</sup> The right panel displays a case where lying does not materially benefit senders. Since the rewards of truthfully reporting the blue state are 10, which is strictly higher than any of the rewards for misreporting an orange state, we predict no lying after observing a blue state regardless of the presence or absence of lying costs. The frequency of misreporting is indeed low, although not zero (3.5%; 5.4%; 17.7%).<sup>16</sup> Another assumption of our model is that individuals differ in their lying cost. Consistent with this assumption, we observe significant individual differences in misreporting. All senders misreport the true state in at least one of their decisions. The median sender sends an untruthful report in six out of the twelve decisions. A minority (10%) of senders misreport more than three quarters of the states they observe.

**Figure 2:** Propensity to follow by report type and senders' rewards for reporting orange.



*The left panel shows following rates for orange reports, and the right panel shows following rates for blue reports. Orange reports should always be followed, since it costs the sender to report that the world is orange. Blue reports should be followed only when the Receiver believes the sender's incentive to lie (report blue when the world is orange) does not outweigh their psychological lying costs.*

A second validation of our theoretical considerations is that receivers follow senders' reports in a way that is consistent with expectations of positive lying costs. Overall, receivers follow an orange report in 88% of cases, close to the predicted rate of 100%. Upon receiving a blue report, receivers follow it significantly less often (52%; chi square test,  $p < 0.001$ ).<sup>17</sup> The left

<sup>15</sup>There is no significant difference between rates of misreporting for cases with low (£2) versus medium (£5) rewards for reporting truthfully (chi square test,  $p = 0.120$ ), and there is a significant difference between lying rates for medium (£5) versus high (£8) rewards (chi square test,  $p < 0.001$ ).

<sup>16</sup>The fact that there is some lying when the costs of lying are low (£2) could be explained in two ways. Some senders may hold pure preferences for lying or antisocial preferences towards the receiver which they express when they can do so cheaply. Alternatively, senders might hold pro-social preferences and believe that receivers will never follow an orange report when the lying cost of the sender is low. That is, they may engage in pro-social lying by reporting orange in order to encourage the receiver to choose blue.

<sup>17</sup>This is also in line with the stated beliefs we elicit from receivers after each decision. Receivers subjectively

panel of figure 2 shows that the propensity to follow an orange report is high and, as predicted, approximately equal across different costs of truth telling (chi square test,  $p > 0.05$ ). In the right panel, the frequencies of following a blue report vary with the benefits from misreporting. Receivers are more likely to follow a blue report when senders benefit less from misreporting. While there are no significant differences between high and medium benefits from misreporting (chi square test,  $p = 0.771$ ), senders follow blue reports significantly more often when the benefits from mis-reporting are low (chi square test Test,  $p < 0.001$ ). There is large individual heterogeneity in following a blue report: some receivers (10%) never follow a blue report; the median rate of following is 33 percent; and some receivers (10%) follow all of the blue reports they see.

Both senders' and receivers' behaviour is hence broadly in line with a model in which senders' preferences include psychological lying costs that they trade-off against the monetary benefits of lying, and in which receivers account for such preferences when deciding whether or not to follow a blue report. Regression tests contained in tables 4 and 5 of the Appendix show that these observations continue to hold after controlling for further game parameters, order, and individual characteristics. Jointly, these observations form the basis of our analysis of stage 3.

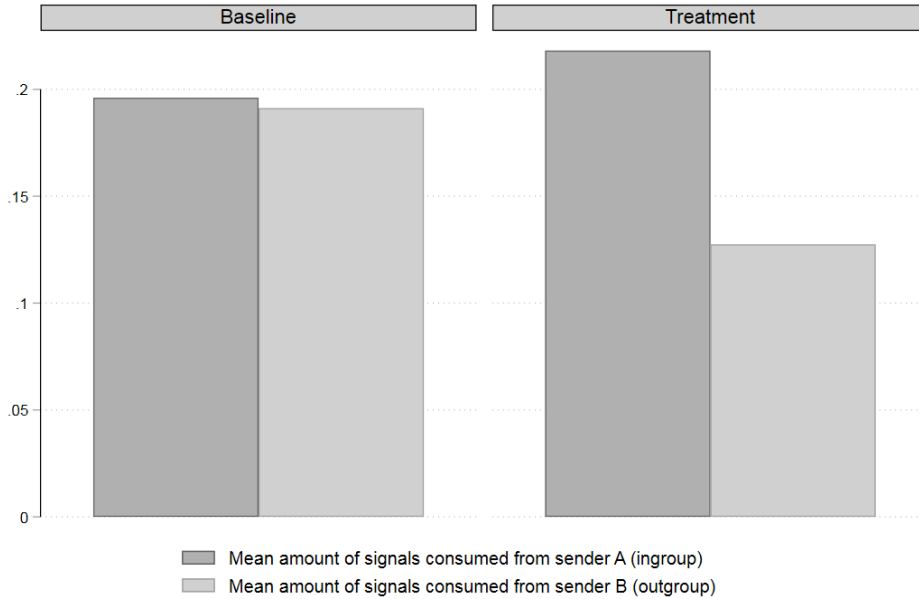
## 4.2 Report purchases in stage 3

Stage 3 was designed to shed light on the main question of our paper: how do observable group affiliations affect the acquisition of reports and consequently influence receiver's behaviour? In particular, do senders' group affiliations affect the number and composition of reports that receivers purchase? As laid out in the introduction and section 2.3, different acquisition patterns could reflect the presence of 'absolute groupishness' if a shared group affiliation increases receivers' perception of senders' lying costs relative to the perceived lying costs of outgroup senders.

Receivers could purchase up to two reports from two different senders in each round before submitting their guess. A significant minority of senders made use of this option: in 14.58% of decisions a report was purchased from at least one sender and in 11.03% of decisions receivers purchased reports from both senders. Figure 3 gives a first indication that sharing a group affiliation does not affect the number of reports purchased, but does affect the composition. In the baseline (left panel), where senders' group affiliation is not observable, receivers purchase a statistically indistinguishable number of reports from senders in their ingroup and outgroup (Sign-Rank Test,  $p = 0.777$ ).

The number of purchased reports, averaged over both sources, does not differ between baseline and treatment (right panel) condition (Ranksum Test,  $p = 0.768$ ). However, the composition of purchased reports suggests that receivers in the treatment group prefer reports from senders judge an orange report as more truthful than a blue report (76 vs. 64 on a scale from 1-100; Rank Sum Test,  $p < 0.001$ ).

**Figure 3:** Average purchase of reports by sender type and treatment



*The left panel shows the proportion of reports purchased from each sender type in the baseline condition where sender identities were not observable. The right panel shows the proportion of reports purchased from each sender type in the treatment condition where sender A was identifiable as the ingroup sender and sender B was identifiable as the outgroup sender.*

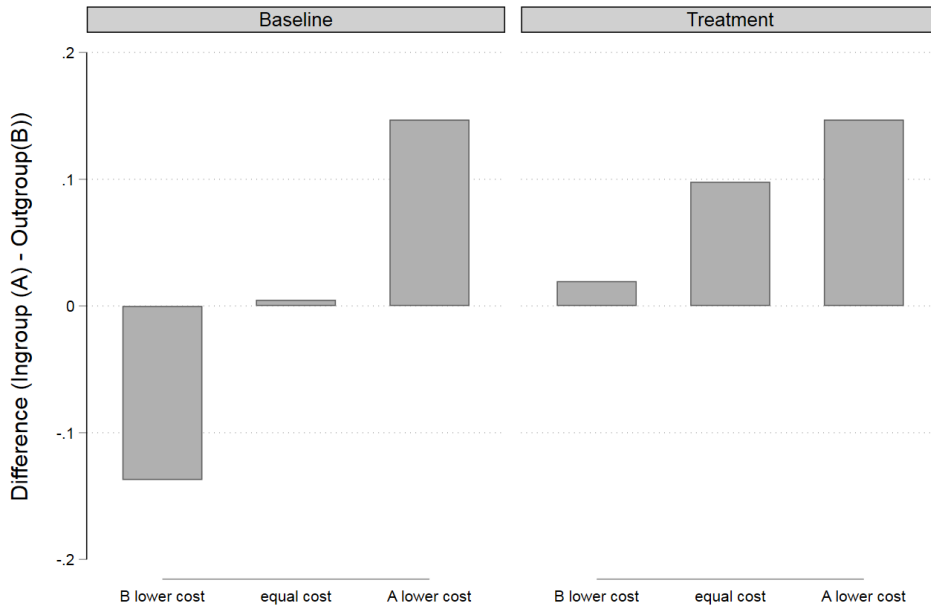
with whom they share a group affiliation compared to reports from senders with a different group affiliation (Sign-Rank Test,  $p < 0.001$ ). Relative to the baseline, making group affiliations observable does not significantly increase the purchases of ingroup reports (Chi2 Test,  $p = 0.437$ ). Instead, it significantly reduces the purchase of outgroup reports (Chi2 Test,  $p = 0.013$ ). Overall, this suggests that a shared group affiliation does not lead receivers to consume an excessive amount of ingroup reports but rather that it leads them to ignore information available from outgroup senders.

An immediate question that follows from this observed change in composition is whether and how observable group affiliations override other possible indicators of report quality. In the baseline, receivers can base their purchase choices on senders' incentives to report truthfully. Receivers should only consume a report if they assume that this report is informative because they believe that its sender has a sufficiently high incentive to truthfully report the state of the world. In a given choice problem, they should hence prefer reports from senders with lower costs of reporting truthfully over reports from senders with higher cost of reporting truthfully (or they should purchase reports from neither of the two senders). Figure 4 shows that this description closely fits the pattern of receivers' choices in the baseline condition (left panel).

When group identity is not known and when the outgroup sender has a lower cost of reporting truthfully than the ingroup sender, receivers preferentially consume reports from outgroup



**Figure 4:** Differences in report purchases



*Differences in report purchases between Sender A (Ingroup) and Sender B (Outgroup) by senders' truth-telling costs (a higher cost corresponds to a lower payoff from sending the orange report). A negative value indicates that Sender B reports were purchased more often than Sender A reports in a given setting. The left panel shows the baseline condition where sender identities were not observable. The right panel shows the treatment condition where Sender A was identifiable as an ingroup member and Sender B was identifiable as an outgroup member.*

senders. Similarly, when their ingroup sender has the lower cost of reporting truthfully, receivers prefer to consume ingroup reports. The size of these differences is approximately equal. When both senders have equal costs of reporting truthfully, there is no detectable preference for either sender. This pattern changes distinctively in the treatment condition in which receivers can observe group affiliation in addition to the senders' monetary cost of reporting truthfully (right panel). When ingroup senders have lower costs of reporting truthfully, receivers continue to prefer reports from ingroup senders. The relative preference for purchasing ingroup reports is, however, not significantly higher in the treatment than in the baseline (Rank Sum test,  $p = 0.958$ ). When both ingroup and outgroup senders have equal cost of reporting truthfully, receivers in the treatment preferentially purchase reports from ingroup senders; this differs significantly from the baseline (Rank Sum test,  $p = 0.002$ ). Finally, and most strikingly, even when outgroup senders face lower costs of reporting truthfully, receivers still preferentially purchase ingroup reports (Rank Sum test,  $p < 0.001$ ).<sup>18</sup>

In sum, we find that a shared group affiliation between senders and receivers has a strong impact on the information acquisition choices of receivers. This effect is strong enough to override other observable indicators of report quality: even when outgroup senders have lower incentives to

<sup>18</sup>Splitting the sample further by the size of differences between ingroup and outgroup truth-telling costs leads to results in line with those reported in the figure.

misreport the true state of the world, their reports are ignored in favour of those from ingroup senders. These results are in line with a model in which receivers assume that senders have positive lying costs, and in which the lying costs of outgroup members are assumed to be lower than those of ingroup members (i.e., outgroup members are assumed to be more willing to lie). To the degree that senders actually react to their lying incentives, this may have adverse consequences for the quality of decision making of receivers in the treatment condition relative to the baseline. Before we explore the quality of choices in the final part of the results section we will explore in greater detail individual heterogeneity in the decision to purchase reports. In appendix 6.2.2 we provide an extensive set of robustness checks that corroborate all central results of this section.

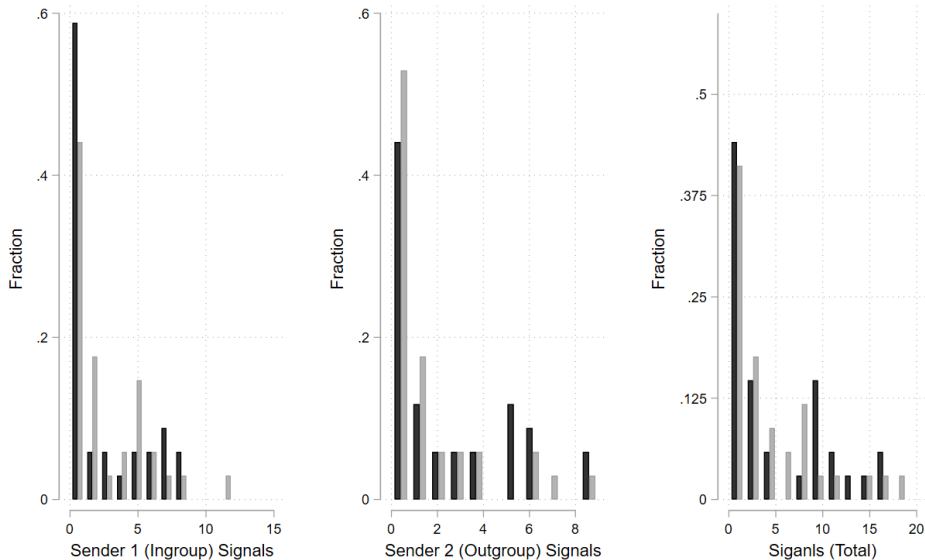
### 4.3 Who purchases reports?

Receivers in our experiment differ greatly in the total amount of reports they purchase in stage 3. We count the number of reports each receiver purchases from each sender type. The left panel of Figure 5 plots histograms of this count across all receivers for reports purchased from Sender 1, who is by definition an ingroup member (although in the control group this identity is hidden). The middle panel displays the same for reports purchased from Sender 2, the outgroup sender (again, identity is only known in the treatment). The right panel shows how many reports receivers choose out of the 24 purchase opportunities they encounter. The black bars show the number of reports purchased in the baseline where group identity is not known, and the grey bars show the number reports purchased in the treatment, where group identity is known.

Roughly 40% of receivers do not purchase any reports. The median receiver purchases at least one report per sender type and a majority of receivers purchase between one and ten reports. Few receivers purchase more than twelve (50%) reports. There are also noticeable differences in purchasing behaviour across treatments. The proportion of receivers who do not purchase any ingroup reports falls in the treatment condition. Similarly, the proportion of receivers who purchase no outgroup reports rises in the treatment condition. This indicates that knowing the senders' group identities leads to some changes in signal acquisition at the extensive margin.

We next explore whether the number of reports purchased can be explained by individual characteristics, and/or by stage 1 behaviour. In particular, we use stage 1 behaviour to identify receivers that placed higher trust into senders' reports, meaning they were willing to follow a blue report when blue was the less common state of the world. In addition to this task-specific trait, we control for other individual traits that may explain information preferences. Table 2 summarises the results of regression analyses which take the number of reports purchased from the ingroup (cols (1)-(3)) and outgroup (cols (4) - (6)) as the dependent variables. The propensity to follow a blue ingroup report in Stage 1 has large predictive power in explaining ingroup report purchases in stage 3, both in the treatment and the baseline condition (col 2). In column 3 we control for a large set of individual characteristics and personality traits. None of cognitive abilities (CRT score), major of study, Big5 personality traits, or stated risk aversion along mul-

**Figure 5:** Distribution of total reports purchased by treatment and sender type.



*Histograms for the total amount of reports purchased by each receiver. The left panel displays results for Sender 1 (ingroup). The middle panel contains results for Sender 2 (outgroup). The right panel sums over both sender types. Black bars are from receivers in the baseline (senders’ group identities are unknown). Grey bars are from receivers in the treatment condition (senders’ group identities are known).*

tiple domains (DOSPERT scores) is significantly associated with the number of ingroup reports that receivers purchase. For outgroup reports, general trust in Stage 1 reports does not predict the number of report purchases (col (4)). Column 5 explores this finding further, and shows how, when the interaction between treatment and prior trust is included, we observe a significant main effect of prior trust, but that there is no such relationship in the treatment condition.

It appears that displaying senders’ outgroup affiliation in the treatment condition overrides the general propensity to trust reports when senders’ identities are unknown. It is as though senders in stage 1 perceived all senders as if they belonged to an ingroup. Their propensity to trust these pseudo-ingroup members carried forward into stage 3 when ingroup identity was made explicit, as revealed through the strong predictive power identified in ‘2. By contrast, being faced with an outgroup sender in stage 3 appears to override the general propensity to trust or distrust.

#### 4.4 Quality of choices

How do purchased reports affect the quality of receivers’ decision making? Figure 6 shows, for both stage 1 and stage 3 decisions, the frequency of correct guesses in the baseline and the treatment condition. The dashed line serves as a reference, indicating the expected frequency of correct guesses of a hypothetical receiver who bases their guesses solely on their initial priors,

**Table 2:** Treatment Effects on Reports Purchased

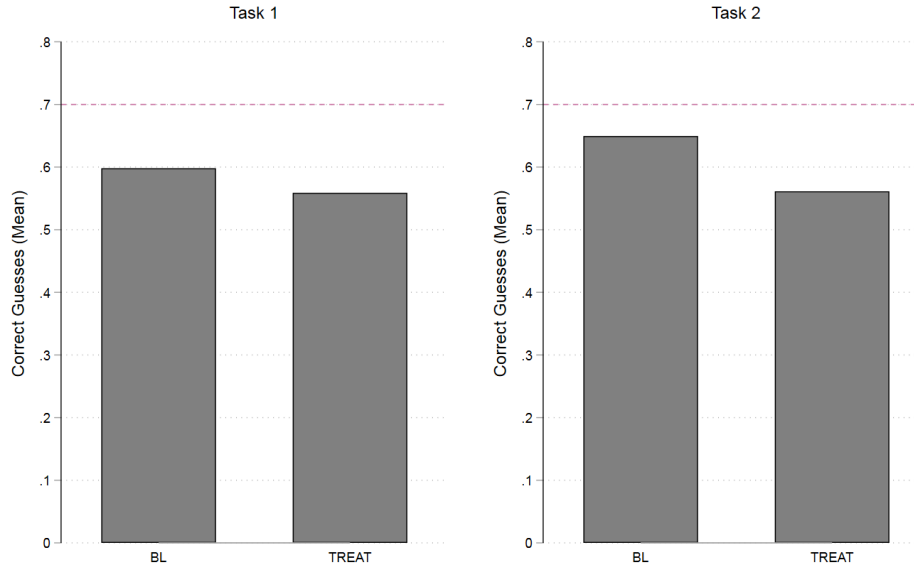
	(1)	(2)	(3)	(4)	(5)	(6)
	Ingroup Report	Ingroup Report	Ingroup Report	Outgroup Report	Outgroup Report	Outgroup Report
PercentageBlue	2.829** (2.38)	3.336** (2.30)	2.893** (2.18)	1.482 (1.62)	2.797** (2.21)	1.571 (1.51)
Treatment (1=Yes)	0.0742 (0.11)	0.534 (0.52)	0.715 (0.91)	-0.865 (-1.39)	0.329 (0.37)	-0.188 (-0.27)
Treatment*PercentageBlue		-1.059 (-0.44)			-2.751 (-1.54)	
CRT (0-3)			0.477 (1.36)			0.209 (0.69)
Economist			0.0487 (0.05)			-0.323 (-0.33)
Gender			-0.190 (-0.22)			-0.107 (-0.14)
BigC			-0.751* (-1.71)			-0.518 (-1.53)
BigE			0.340 (1.05)			0.272 (1.02)
BigN			0.404 (1.11)			-0.0905 (-0.30)
Big0			-0.310 (-0.84)			-0.158 (-0.47)
BigA			0.459 (1.35)			0.351 (1.15)
DOSPERTrec			0.509 (1.40)			0.330 (1.04)
DOSPERTfic			0.0848 (0.16)			0.262 (0.56)
DOSPERThs			0.129 (0.28)			0.578 (1.30)
DOSPERTet			-0.664 (-1.29)			-1.076** (-2.11)
DOSPERTsoc			-0.0157 (-0.04)			-0.146 (-0.40)
Constant	1.225** (2.17)	1.023* (1.79)	-0.923 (-0.20)	1.703*** (3.18)	1.179** (2.01)	1.276 (0.31)
Observations	68	68	68	68	68	68

*t* statistics in parentheses

\*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$ , \*\*\*\*  $p < 0.001$

either by not acquiring any reports, or ignoring them. Such behaviour, on average, would result in correct guesses in 70% of cases.

**Figure 6:** Average purchase of reports by sender type and treatment. The dashed line represents the expected success rate if initial priors are followed without updating. In all cases, success falls short of the no information efficient result, and group affiliation exacerbates the problem



Relative to this reference point, receivers in stage 1 are significantly less likely to guess correctly, both in the baseline (59.8%) and the treatment (55.8%) conditions (one-sided binomial tests,  $p < 0.001$ ).<sup>19</sup>

Making group affiliations observable in the treatment condition of stage 3 negatively impacts the quality of receivers' eventual guesses about the state of the world. As discussed above, receivers in the treatment condition are less likely to purchase reports from outgroup members, even when their incentives to misreport are lower than those of ingroup members. This tendency is reflected in significant differences in decision quality. While receivers in the baseline condition of stage 3 are able to correctly guess the state of the world in 65% of cases, receivers in the treatment condition are only correct 56% of the time (chi square test,  $p = 0.052$ ). More precisely, whilst receivers in the control condition improve their performance slightly from stage 1 to stage 3, the same is not true for those in the treatment condition. The proportion of correct guesses does not reach its expected level in any condition.

Overall, in line with previous findings (e.g. , bayindir2020cheap,cai2006overcommunication) this indicates that receivers have an excessive tendency to follow senders' reports. Differences between the baseline and treatment condition could reflect both over-purchasing of lower quality reports and an increased propensity to follow such reports. We explore this issue further through

<sup>19</sup>The frequency of correct guesses in stage 1 does not differ significantly between the baseline and treatment conditions, indicating successful randomisation of participants to treatments.

regression analysis.

In table 3 we show the results of a two-stage probit regression procedure. In the first regression stage we regress receivers' endogenous information acquisition choices on a treatment dummy, game parameters, and their interaction. In the second regression stage, we explain the propensity to guess blue (model 1) and the propensity to guess correctly (model 2) by the predicted report acquisition choices. The first stage regression results confirm our previous analysis. First, receivers in the treatment condition are marginally more likely to purchase an ingroup report, and acquisition choices reflect senders' reporting incentives in the predicted way, without significant differences between the baseline and treatment conditions. Second, receivers in the treatment condition are significantly less likely to consume outgroup reports, particularly when the outgroup sender has a strong incentive to lie. The second stage demonstrates that those senders who purchase a report are more likely to guess a blue state and are more likely to submit an incorrect guess, compared to senders who do not purchase a report. Purchasing a report from an ingroup sender has a much stronger effect on these outcomes than purchasing a report from an outgroup sender. Since receivers are more likely to ignore outgroup reports in the treatment condition this can explain differences in aggregate decision quality.

**Table 3:** Effects on Quality of Decisions

	(1)	(2)
	Guess=Blue	Guess=Correct
Ingroup Report(1=Purchased)	2.062**** (4.29)	-1.882**** (-5.77)
Outgroup Report(1=Purchased)	0.913* (1.71)	-1.032** (-2.51)
Constant	-0.665*** (-3.20)	0.573**** (5.61)
First Stage (Ingroup)		
Treatment (1=Yes)	0.0508 (1.60)	0.0581* (1.88)
No Reward Difference	0.0299 (0.57)	0.0463 (1.21)
Higher Rewards Ingroup	0.0899* (1.82)	0.0945** (2.02)
Treatment $\times$ No Reward Difference	0.00163 (0.03)	-0.0164 (-0.50)
Treatment $\times$ Higher Rewards ingroup	-0.0434 (-1.18)	-0.0493 (-1.44)
Constant	0.149**** (3.84)	0.142**** (4.32)
First Stage (Outgroup)		
Treatment (1=Yes)	-0.101*** (-2.67)	-0.0959*** (-2.62)
No Reward Difference	-0.112** (-2.45)	-0.100*** (-2.60)
Higher Rewards ingroup	-0.180**** (-4.21)	-0.178**** (-4.26)
Treatment $\times$ No Reward Difference	0.0560 (1.12)	0.0438 (1.02)
Treatment $\times$ Higher Rewards ingroup	0.0880* (1.77)	0.0864* (1.86)
Constant	0.286**** (8.17)	0.280**** (8.75)
Observations	816	816

*t* statistics in parentheses

\*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$ , \*\*\*\*  $p < 0.001$

## 5 Discussion and Conclusion

### 5.1 Summary

There are increasing concerns that people acquire information from unreliable sources and act upon it to the detriment of their welfare. Here we report evidence from the first experimental investigation into the effect of absolute groupishness on sub-optimal information acquisition decisions. Making experimentally induced group identity salient to receivers leads them to purchase fewer reports from outgroup senders, especially when outgroup senders have a relatively low incentive to misreport. Importantly, this expression of absolute groupishness constitutes a ‘bias’ in the sense that it reduces efficiency. It harms receivers by leading them to purchase fewer informative reports, thereby harming their ability to correctly guess the true state of the world.

We stress that apart from displaying ‘absolute groupishness’, receivers in our experiment acted mostly in line with their own monetary self-interest. This is especially evident in Task 1. Here, receivers were less likely to follow information from senders with a higher monetary incentive to misreport. Similarly, in Task 2, report purchases in the baseline condition strongly reflected relative incentives for truth-telling. Both observations are in line with the predictions of a model in which senders trade off psychological lying costs against the material payoffs from lying, and in which receivers anticipate this pattern correctly. This leads us to conclude that ignoring potentially useful outgroup information is not a result of confusion or disengagement with the task, and instead represents an important and previously neglected facet of behaviour.

In our setting, senders did not know the identity of the receiver(s). As such, our results rule out that receivers anticipated ‘reciprocity-based groupishness’ on the part of the sender and made their information purchases accordingly. Instead, the only way that groupishness can account for the ignorance of outgroup information that we observe, is through the channel of ‘absolute groupishness’ - a belief that because the sender is a member of the receiver’s outgroup, they must be inherently more likely to lie. Given these beliefs, a utility maximising agent would prefer to seek information from their ingroup. This is a particularly striking result because group identity was induced experimentally, providing the most stringent test of ‘absolute groupishness’. It appears that simply labelling someone as belonging to a different group is sufficient to create a negative judgement of their trustworthiness.

### 5.2 External applicability

An important abstraction in our setting is that senders are incentivised only in relation to the message they send, and not at all in relation to receivers’ subsequent behaviour. This abstraction is necessary to allow us to cleanly identify the role of perceived truthfulness in explaining absolute groupishness.



Whilst abstract, this setting is potentially relevant for decision making outside of the laboratory. For example, most of social media involves people projecting an image of themselves without aiming to change the behaviour of those who see it. Influencers may support a good cause because they are invested in the message they send (and perhaps in the consequential reward from that message itself, such as the ‘likes’ they receive), with little interest in the effect of their message on the cause they purported to support. In politics, it is possible that in the desire to be perceived as ‘tough on crime’, a political candidate may seek to scapegoat a subgroup in their rhetoric. Their payoff from this messaging comes from the votes they win for their stance, and not from any direct harm against the scapegoated group. In fact, they may be horrified when people behave in a way that harms that group.

In all these settings, reports may be designed to influence the sender’s image. Any material consequences of the misinformation could be considered by the sender as a form of externality. Senders can tell themselves that there is no harm done by their misinformation, because they do not expect receivers to act upon it.

If this account is correct, the most harmful lies are those that are not obvious. In our experiment, a sender with a very low payoff from sending an orange report might send a dishonest blue report, and assume that the receiver will recognise that the sender is lying, and will ignore the report. Sending the blue report is less harmful in this setting, where the receiver has a good chance of identifying the lie. This explanation could further explain the lower rates of lying that we observe when the incentives for sending the orange and blue reports are more finely balanced.

This insight is closely related to the concepts of perceived lying aversion (Dufwenberg and Dufwenberg, 2018), in which psychological costs are incurred if others may perceive you to be lying. Related evidence suggests that this is a motivation for some, but not for all, experimental participants (Gneezy et al., 2018). In our case, the sender who sends an orange report when they see an unlikely but true blue state of the world, may be doing so to avoid being perceived as a probable liar. Another related idea is the importance of the size of the lie. For example, showed that people are more willing to tell smaller or whiter lies. In our setting, lying may be less common because senders do not wish to harm receivers, but also because they may wish to avoid being perceived as liars or cheaters.

Group identity may also play an important role in judging the truthfulness of information sources and information acquisition patterns outside of the abstract setting we study in our experiment. As explored in CITE-RAND DETECTING MISINFORMATION, people are not always good at detecting when information is false or misleading. Moreover, naturally occurring group affiliations have been shown to influence the trust in potentially false information. For instance, in the political arena, voters for both major parties in the US have been found to trust information more if it is ideologically aligned with their party preferences (Allcott and Gentzkow, 2017). Our experimental results show that effects of group affiliation are even present when groups are created artificially and the content of the information is abstract.

### 5.3 Related literature

Our findings contribute to the wider debate about sub-optimal information acquisition decisions. Much of this literature fundamentally differs from our setting in that it is concerned with information that has some consumption value to the recipient, while it can but need not have any instrumental value. For example, studies on motivated beliefs and motivated reasoning suggest that people seek out, react to or ignore information depending on how it corresponds to their prior or preferred beliefs.<sup>20</sup>

A second literature closer to our own paper studies situations where information is of instrumental value. These studies differ from our approach by looking at fundamental errors in information processing when there is no uncertainty about the reliability of a source.<sup>21</sup> In such settings, a bias towards confirmatory evidence has been documented (Charness and Dave, 2017). Also along these lines, Nunnari et al. (2019) focus on understanding how the reliability of a source and its bias jointly affect information acquisition and belief updating. Ambuehl and Li (2018) also study biases in belief updating finding that individuals undervalue high quality information, and that they disproportionately prefer information that may yield certainty. In another recent contribution, Charness et al. (2019) find compelling evidence of confirmation seeking in a lab setting similar to our own.

In sum, these papers study situations in which the receiver cares about the content of the information, either because they wish to find out that their preferred state of the world is the true one, or they wish to confirm that their prior beliefs were correct. Our contribution differs from these contributions in two fundamental ways. First, we are concerned with a different question i.e. whether a joint or diverging group identity with the sender drives information acquisition decisions. Second, we look at an abstract setting in which receivers have no obvious prior reason to prefer the true state of the world to be orange or blue.

### 5.4 Extensions

Overall, we have presented a clean test of absolute groupishness in an information acquisition game with incentives for misinformation. We showed how negative absolute groupishness towards outgroup members appears to strongly bias receivers away from purchasing potentially useful outgroup reports. This results in an overall decline in decision quality when receivers know the group identity of the sender. An unanswered question is whether the effects we uncover are limited to a situation where the quality of information is defined by the truthfulness of the sender. It may, or may not, extend to situations where the information quality depends on the sender's ability, not their truthfulness. Another fruitful avenue for future research would be to investigate the extent to which absolute groupishness plays out in high stakes decision

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<sup>20</sup>See for example, Ditto and Lopez (1992), Gentzkow et al. (2018), and Zimmermann et al. (2019). Epley and Gilovich (2016) and Bénabou (2015) provide expansive overviews of the topic.

<sup>21</sup>Instead, our paper is concerned with how people misjudge the reliability of a source due to the phenomenon of 'absolute groupishness' among those who share a common group affiliation.

making across contexts, and thereby understand its role in some of the societal, economic and political decisions shaping the world.

## References

- J. Abeler, D. Nosenzo, and C. Raymond. Preferences for truth-telling. *Econometrica*, 87(4): 1115–1153, 2019.
- G. A. Akerlof and R. E. Kranton. Economics and identity. *The Quarterly Journal of Economics*, 115(3):715–753, 2000.
- H. Allcott and M. Gentzkow. Social media and fake news in the 2016 election. *Journal of economic perspectives*, 31(2):211–36, 2017.
- S. Ambuehl and S. Li. Belief updating and the demand for information. *Games and Economic Behavior*, 109:21–39, 2018.
- R. Bénabou. The economics of motivated beliefs. *Revue d'économie politique*, 125(5):665–685, 2015.
- H. Bernhard, E. Fehr, and U. Fischbacher. Group affiliation and altruistic norm enforcement. *American Economic Review*, 96(2):217–221, 2006.
- M. B. Brewer. The psychology of prejudice: Ingroup love and outgroup hate? *Journal of social issues*, 55(3):429–444, 1999.
- A. Caplin and J. Leahy. Psychological expected utility theory and anticipatory feelings. *The Quarterly Journal of Economics*, 116(1):55–79, 2001.
- A. Caplin and J. Leahy. The supply of information by a concerned expert. *The Economic Journal*, 114(497):487–505, 2004.
- G. Charness and C. Dave. Confirmation bias with motivated beliefs. *Games and Economic Behavior*, 104:1–23, 2017.
- G. Charness, L. Rigotti, and A. Rustichini. Individual behavior and group membership. *American Economic Review*, 97(4):1340–1352, 2007.
- G. Charness, R. Oprea, and S. Yuksel. How do people choose between biased information sources? evidence from a laboratory experiment. *manuscript, downloaded from: [http://econ.ucsb.edu/~sevgi/CharnessOpreaYuksel\\_Aug2019.pdf](http://econ.ucsb.edu/~sevgi/CharnessOpreaYuksel_Aug2019.pdf)*, 2019.
- Y. Chen and S. X. Li. Group identity and social preferences. *American Economic Review*, 99(1):431–57, 2009.
- V. P. Crawford and J. Sobel. Strategic information transmission. *Econometrica: Journal of the Econometric Society*, pages 1431–1451, 1982.

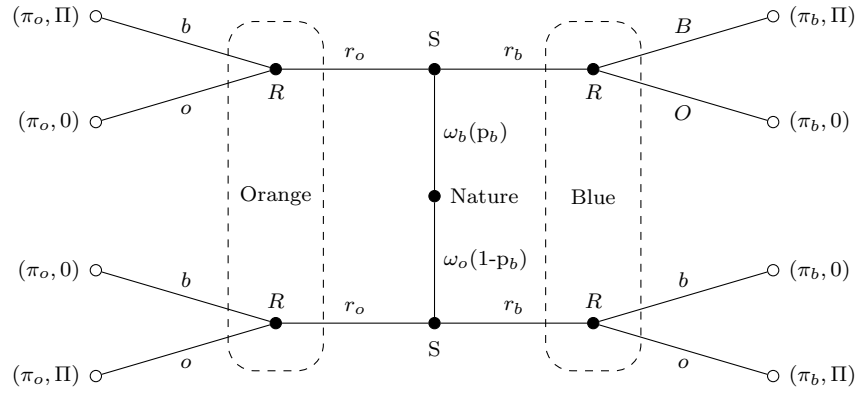
- P. H. Ditto and D. F. Lopez. Motivated skepticism: Use of differential decision criteria for preferred and nonpreferred conclusions. *Journal of personality and social psychology*, 63(4): 568, 1992.
- M. Dufwenberg and M. A. Dufwenberg. Lies in disguise—a theoretical analysis of cheating. *Journal of Economic Theory*, 175:248–264, 2018.
- C. C. Eckel and P. J. Grossman. Managing diversity by creating team identity. *Journal of Economic Behavior & Organization*, 58(3):371–392, 2005.
- N. Epley and T. Gilovich. The mechanics of motivated reasoning. *Journal of Economic Perspectives*, 30(3):133–40, 2016.
- C. Feldhaus, J. Mans, et al. Who do you lie to? social identity and the cost of lying. Technical Report 76, 2014.
- U. Fischbacher. z-tree: Zurich toolbox for ready-made economic experiments. *Experimental economics*, 10(2):171–178, 2007.
- U. Fischbacher and F. Föllmi-Heusi. Lies in disguise—an experimental study on cheating. *Journal of the European Economic Association*, 11(3):525–547, 2013.
- C. Gallier, T. Goeschl, M. Kesternich, J. Lohse, C. Reif, and D. Römer. Leveling up? an inter-neighborhood experiment on parochialism and the efficiency of multi-level public goods provision. *Journal of Economic Behavior & Organization*, 164:500–517, 2019.
- A. Ganguly and J. Tasoff. Fantasy and dread: The demand for information and the consumption utility of the future. *Management Science*, 63(12):4037–4060, 2016.
- M. Gentzkow and J. M. Shapiro. Media bias and reputation. *Journal of political Economy*, 114(2):280–316, 2006.
- M. Gentzkow, M. B. Wong, and A. T. Zhang. Ideological bias and trust in information sources. Technical report, 2018.
- U. Gneezy. Deception: The role of consequences. *American Economic Review*, 95(1):384–394, 2005.
- U. Gneezy, B. Rockenbach, and M. Serra-Garcia. Measuring lying aversion. *Journal of Economic Behavior & Organization*, 93:293–300, 2013.
- U. Gneezy, A. Kajackaite, and J. Sobel. Lying aversion and the size of the lie. *American Economic Review*, 108(2):419–53, 2018.
- L. Goette, D. Huffman, and S. Meier. The impact of group membership on cooperation and norm enforcement: Evidence using random assignment to real social groups. *American Economic Review*, 96(2):212–216, 2006.

- L. Goette, D. Huffman, and S. Meier. The impact of social ties on group interactions: Evidence from minimal groups and randomly assigned real groups. *American Economic Journal: Microeconomics*, 4(1):101–15, 2012.
- C. Gollier. *The economics of risk and time*. MIT press, 2004.
- R. Golman, D. Hagmann, and G. Loewenstein. Information avoidance. *Journal of Economic Literature*, 55(1):96–135, 2017.
- B. Greiner. Subject pool recruitment procedures: organizing experiments with orsee. *Journal of the Economic Science Association*, 1(1):114–125, 2015.
- S. P. Hargreaves Heap and D. J. Zizzo. The value of groups. *American Economic Review*, 99(1):295–323, 2009.
- R. Hertwig and C. Engel. Homo ignorans: Deliberately choosing not to know. *Perspectives on Psychological Science*, 11(3):359–372, 2016.
- N. Kartik. Strategic communication with lying costs. *The Review of Economic Studies*, 76(4):1359–1395, 2009.
- B. Köszegi. Emotional agency. *The quarterly journal of economics*, 121(1):121–155, 2006.
- S. Nunnari, G. Montari, et al. Audi alteram partem: An experiment on selective exposure to information. Technical report, 2019.
- E. Oster, I. Shoulson, and E. Dorsey. Optimal expectations and limited medical testing: evidence from huntington disease. *American Economic Review*, 103(2):804–30, 2013.
- J. C. Turner and H. Tajfel. The social identity theory of intergroup behavior. *Psychology of intergroup relations*, 5:7–24, 1986.
- M. Vaduganathan, J. van Meijgaard, M. R. Mehra, J. Joseph, C. J. O’Donnell, and H. J. Warraich. Prescription fill patterns for commonly used drugs during the covid-19 pandemic in the united states. *Jama*, 2020.
- O. Weisel and R. Böhm. “ingroup love” and “outgroup hate” in intergroup conflict between natural groups. *Journal of experimental social psychology*, 60:110–120, 2015.
- G. Yamey and G. Gonsalves. Donald trump: a political determinant of covid-19. *BMJ*, 369, 2020. doi: 10.1136/bmj.m1643. URL <https://www.bmj.com/content/369/bmj.m1643>.
- F. Zimmermann et al. The dynamics of motivated beliefs. Technical report, University of Bonn and University of Mannheim, Germany, 2019.

## 6 Appendix

### 6.1 Theory

**Figure 7: Game Structure**



Extensive form of sender-receiver game used in task 1 of the experiment. Sender's payoff on the left, Receiver's payoff on the right

## 6.2 Further Results and Tables

### 6.2.1 Task1

**Table 4:** Task 1 – Lying Behaviour

	(1)	(2)
	Lying	Lying
Reward Orange 5 (1=Yes)	-0.279** (-2.01)	-0.290** (-2.09)
Reward Orange 8 (1=Yes)	-1.189**** (-7.19)	-1.189**** (-7.26)
True State Blue (1=Yes)	-3.190**** (-7.61)	-3.183**** (-7.53)
Reward5 × Blue	0.484* (1.68)	0.492* (1.73)
Reward8 × Blue	2.127**** (5.29)	2.127**** (5.20)
Order Dummies	YES	YES
Frequency of blue balls ( $p_b$ )	YES	YES
Individual Controls	NO	YES
Constant	1.486**** (8.40)	2.812** (2.43)
Observations	816	816

*t* statistics in parentheses

\*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$ , \*\*\*\*  $p < 0.001$

### 6.2.2 Task3

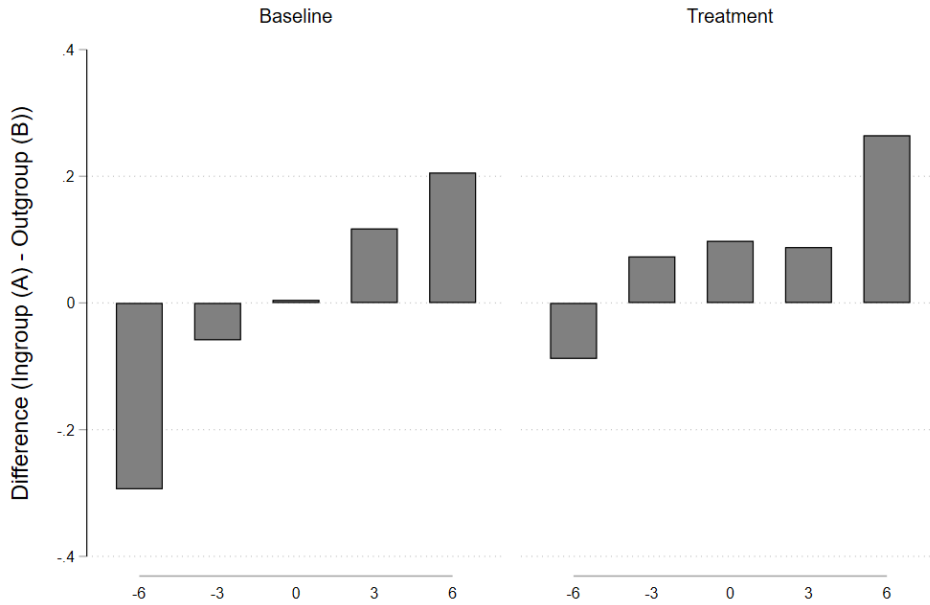
Figure 8 demonstrates that the differences in report acquisition patterns across treatments persist when we use five instead of three categories for the differences in incentives.

**Table 5:** Task 1 – Following Behaviour

	(1)	(2)
	Follow	Follow
Reward Orange 5 (1=Yes)	0.860 (1.57)	0.860 (1.57)
Reward Orange 8 (1=Yes)	0.281 (0.76)	0.262 (0.72)
Report (1=Blue)	-0.983** (-2.44)	-0.961** (-2.44)
Reward5 × Report	-0.933* (-1.69)	-0.932* (-1.69)
Reward8 × Report	0.148 (0.36)	0.180 (0.44)
Order Dummies	YES	YES
Frequency of Blue Balls ( $p_b$ )	YES	YES
Individual Characteristics	NO	YES
Constant	0.429 (1.10)	1.859* (1.88)
Observations	816	816

*t* statistics in parentheses

\*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$ , \*\*\*\*  $p < 0.001$

**Figure 8:** Difference in report purchases

Differences in report purchases between Sender A (Ingroup) and Sender B (Outgroup). A negative value indicates that Sender B reports were purchased more often than Sender A reports in a given decision. The left panel shows the baseline condition where sender identities were not observable. The right panel shows the treatment condition where Sender A was identifiable as an ingroup member and Sender B was identifiable as an outgroup member.