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Selective Information Sharing and Group Delusion*

Anton Suvorov[†] Jeroen van de Ven[‡] Marie Claire Villeval[§]

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Abstract

Although they usually manage to combine information to make well-informed decisions, groups also make mistakes. We investigate experimentally one source of sub-optimal decision-making by groups: the selective and asymmetric sharing of ego-relevant information within teams. We show that good news about one's performance is shared more often with team members than bad news. Asymmetric information sharing combined with the receivers' selection neglect boosts team confidence compared to an unbiased exchange of feedback. Consequently, weaker teams make worse investment decisions in bets whose success depends on the team's ability. The endogenous social exchange of ego-relevant information may foster detrimental group delusion.

Keywords: Group Delusion, Information Disclosure, Beliefs, Skepticism, Social Image, Experiment

JEL Codes: C91, C92, D83, D84, D91

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1 Introduction

Many decisions are made in groups. By sharing knowledge and getting exposure to different opinions, groups often benefit from the “wisdom of the crowds” (Surowiecki, 2005; Sunstein, 2006).¹ Through cooperation, working together as a group has clear benefits. Yet, plenty of real-life examples show evidence of a “madness of crowds” (Mackay, 1841). Group failures occur despite warning signals that should have alerted group members about the need to address pressing problems. Consider the case of Nokia. After its market share had dropped, the company that was once dominating the mobile phone market was forced to reorganize in 2013. For too long, the company relied on the Symbian operating system, which was overly complex and ill-suited for keeping up with the fast technological progress in the smartphone market. The limitations of Symbian were known within parts of the organization, but top management remained optimistic and decided to stay with the technology they had. Underestimating the threat of the competitors, management was confident they were taking the right course of action. Such collective overconfidence is not limited to Nokia but prevails in many organizations (Meikle et al., 2016).

How do groups become overconfident? Surprisingly little is known about this. While overconfidence at the individual level has been widely investigated, including among managers (*e.g.*, Malmendier and Tate, 2005; Gervais and Goldstein, 2007; Ben-David et al., 2013; Banerjee et al., 2023), studies on group overconfidence are sparse.² Bénabou (2013) takes the perspective of “groupthink” (a term coined by Janis (1972)), in which agents deny or willfully ignore public signals. He shows theoretically how such behavior can be contagious, creating a situation of collective denial. At the core of his proposed mechanism are agents with anticipatory utility, who may want to ignore or discount pessimistic news to maintain hopeful beliefs. When individuals suffer from others’ blindness to negative signals, they also tend to deny these signals themselves because of the loss attached to them, making blindness contagious.

In this paper, we experimentally explore a related mechanism that could induce group delusion and explain the persistence of group overconfidence over time: group members may share information with others selectively, favoring the transmission of good news rather than bad news. Selective sharing of news, in combination with selection

¹In a survey of the experimental literature, Charness and Sutter (2012, p. 158) conclude that, compared to groups, individuals are “more likely to be influenced by biases, cognitive limitations, and social considerations.” Outside of the lab, Patel and Sarkissian (2017) showed that team-managed mutual funds outperform solo-managed while Fang and Hope (2021) found that teams of sell-side equity analysts generate more accurate earnings forecasts than individual analysts.

²There are very few exceptions. Bruhin et al. (2022) study how confidence affects effort on a team task when there are complementarities between team members. Kogan et al. (2021) investigate how individuals involved in an inter-group competition form beliefs about their group’s relative performance. They find a similar bias in both the individual baseline and the collective setting, consistent with the results of Healy and Pate (2007). Cacaault and Grieder (2019) find overconfidence in their group’s ability when individuals have to guess the performance of their in-group members. None of these studies consider how members share feedback, the main focus of our study.

neglect, leads groups to fall prey to collective overconfidence.³

Rather than certain pieces of information being ignored, we hypothesize that they may not be shared in the first place. Ego-utility and image concerns (as in [Bénabou and Tirole \(2002\)](#), [Bénabou and Tirole \(2006\)](#) and [Kőszegi \(2006\)](#)) can bias conversation and discourage individuals from sharing information that could harm their reputation or social standing: successes are shared more easily than failures.⁴ If team members hold back negative feedback, and if their peers do not fully correct for this selection bias, this may lead peers to overestimate the quality of their team. Such inflated beliefs can result in poor decisions, such as excessive risk-taking or not stopping a project on time. A detailed account of what happened at Nokia identified selective news sharing as the root cause of the decline. Based on interviews with insiders, [Vuori and Huy \(2014, 2016\)](#) document how middle managers did not want to show any weaknesses or limitations (see also [Lamberg et al., 2021](#)). In their words,

“Together, these fears [of losing social status] shaped a collective emotional climate which influenced what information was shared (or rather not shared) in meetings. Middle managers were happy to allow senior managers to believe that deadlines, which were unrealistic, would be met for developing the Symbian software platform...” ([Vuori and Huy, 2014](#))

Risto Siilasmaa, who would later be the chairman of Nokia, corroborates these conclusions. In his book, he repeatedly describes how bad news was not percolating up from the bottom, identifying the reluctance to share news as the first of four ‘toxic symptoms of success’ ([Siilasmaa, 2018](#), Chapter 4). Although less well documented, many other organizations show signs of experiencing similar problems, as sometimes revealed in insider accounts and investigation reports.⁵

³In this study, we focus on group overconfidence. This choice does not imply that we consider overconfidence as the sole or primary issue teams face. Team dynamics are influenced by a myriad of challenges, each with different impacts on decision-making, such as free-riding, social loafing, coordination costs, and conflicts of interest. By focusing on group overconfidence, our research serves as stepping stone toward a deeper understanding of the factors that influence team success or failure.

⁴For example, researchers share on social media the journals’ decisions to publish their papers, rarely the rejection decisions. Positive experiences are over-represented on Facebook ([Arad et al., 2023](#)). Stock market participation is affected by peers’ high returns and not by peers’ unfavorable outcomes, which is consistent with investors being more likely to talk about their favorable experiences ([Kaustia and Knpper, 2012](#)). Investors’ self-enhancing transmission bias may lead to poor investment strategies when coupled with overextrapolation of performance reports and selection neglect ([Han et al., 2022](#)). Messages posted by traders on online trading platforms increase with their performance ([Ammann and Schaub, 2016](#)) and traders exchange more information about their trading gains than their losses in instant messages ([Lane et al., 2022](#)). In politics, individuals both selectively share news signals about their preferred candidate on social media and tend to neglect such selection when interpreting news, which favors polarization (*e.g.*, [Pogoreslkiy and Shum, 2019](#); [Bowen et al., 2023](#)).

⁵For example, in their internal communications, Enron’s executives frequently emphasized the company’s superiority and dismissed skepticism ([McLean and Elkind, 2003](#)). Lehman Brothers’ executives often dismissed internal warnings about their exposure to subprime mortgages ([McDonald, 2009](#)). The Deepwater Horizon Accident Investigation report of September 8, 2010, indicated: “There was a pervasive overconfidence in the effectiveness of the existing safety measures, leading to the dismissal or underestimation of critical risk factors.” (p. 113).

Despite the relatively detailed documentation of events at Nokia, establishing selective information sharing and its effects on confidence in everyday life of companies is still very challenging without knowing the exact information flows and beliefs that people hold. Our first objective is thus to experimentally document whether individuals do share information selectively with group members. In practice, several motives can exist to share information selectively with others. In this study we focus on reputational and image concerns, whereby participants care about the impression they make on their peers; we reinforce this motive by making information to be shared (or not shared) ego-relevant. We hypothesize that subjects are more likely to share positive performance feedback than negative feedback, and that, compared to a situation in which feedback is shared without a bias, this leads to group overconfidence⁶ and worse decision making. We also study whether group overconfidence is amplified in larger groups. On the one hand, more information can be shared in larger groups, allowing larger groups to form more accurate beliefs. On the other hand, the asymmetry in information sharing may become stronger because (i) the larger audience can strengthen image concerns, and (ii) the impact of any individual becomes smaller in a larger group, so that an individual may care less about misrepresenting feedback. Moreover, even if more signals result in more information, it is hard to keep track of all the information, limiting the usefulness of having more signals. We thus expect the negative effects to dominate, resulting in more overconfidence in larger groups.

In our experiment, subjects were allocated to a strong or weak team, based on their relative performance on a preliminary cognitive test. In each of six rounds, they received two types of signals which provided noisy feedback. One of the signals was related to their own performance, and therefore ego-relevant (the *performance signal*). The other signal also contained valuable information but was unrelated to their performance and hence not ego-relevant (the *neutral signal*). In each round, one of the two signals was shared with the team member(s). We introduced the neutral signal as a cover for not sharing performance feedback. We elicited the subjects' confidence about belonging to the strong team at several points during the feedback stage. Subjects could also invest any part of their endowment in a performance bet, which paid off only if they belonged to the strong team. To make this a team task, the amount invested in the bet was determined by the average investment choice of all team members. This made it costly to inflate beliefs about performance towards team members, as this could result in excessive investments by team members.

We implemented a 2x2 design. Our first treatment variation is whether a subject could choose which of the two signals to share with their team member(s) (treatment ENDO), or whether this was selected randomly by the computer (treatment EXO). Treatment ENDO allows us to test if subjects share positive performance feedback more often than negative feedback and are more willing to share neutral signals after receiving

⁶More precisely, "overplacement" in the sense of Moore and Healy (2008).

negative performance feedback. Treatment EXO creates a benchmark that allows us to test if any asymmetry in information sharing results in different confidence levels or investment choices. Our second treatment variation is the team size, which was either 2 or 4. This allows us to test if team size affects the size of the asymmetry in information sharing, and whether this amplifies overconfidence and worsens investment choices.

Our experiment delivers four main findings. First, individuals withhold some of the performance signals they receive and they are more willing to share positive (ego-boosting) performance feedback than negative (ego-threatening) feedback with team members. This asymmetric information sharing is consistent with image concerns and wishful thinking in the perspective of future investment decisions.

Second, endogenously emerging asymmetric sharing of ego-relevant information induces stronger team confidence than when feedback is delivered exogenously within teams, despite repeated feedback. The social exchange of information leads to a weaker updating of excessively confident beliefs in weak teams. The analysis of belief updating indicates that individuals disregard the number of neutral signals received regardless of whether these signals are shared endogenously or exogenously. In principle, when individuals cannot choose which signal to share, receiving a neutral signal from a teammate should be treated as better news than receiving a negative performance signal. This may no longer be true when teammates are in a position to hide negative performance feedback. However, players fail to take their teammates' selective information-sharing into account, which reveals the presence of selection neglect. Therefore, while [Oprea and Yuksel \(2022\)](#) conclude that public signals can correct the biases induced by the social exchange of beliefs, our study shows that this requires that individuals have no discretion in choosing what information they share with others.

Third, endogenous information sharing results in worse investment decisions by weaker teams and does not improve strong teams' investment decisions, compared to exogenous information sharing. Therefore, the rationality of teams may be conditioned on the discretion team members have in sharing information.

Finally, a larger team size does not result in more asymmetric information sharing. Participants in small and large teams have the same tendency to favor sharing positive performance feedback over negative performance feedback. Although in large teams signals are shared by more people, and thus also more positive performance feedback, this does not appear to aggravate team overconfidence or team investments. Suggestive evidence indicates that in the treatment in which participants can choose which feedback to share, individuals in larger teams give a larger weight to negative performance feedback shared by team members.

Overall, our findings on asymmetric information sharing and selection neglect in groups and their negative consequences on team decision-making suggest that organizations could be better off by providing public collective performance feedback to teams rather than only individual performance feedback to their members. So whereas [Sniezek](#)

(1992) stated that a condition for groups to be less overconfident than individuals is that group members can share information, we argue that this is not a sufficient condition if they have discretion in the information they share with others.

The remainder of this paper is as follows. Section 2 characterizes our contribution to the literature. Section 3 outlines our experimental design and procedures. Section 3.3 describes the behavioral conjectures. Section 4 reports the experimental findings and Section 6 discusses these findings and concludes.

2 Related Literature

Our study speaks to several literatures, making several novel contributions. We discuss the most related literatures below, focusing on the empirical studies. Our contributions are to (i) study group confidence rather than individual confidence, (ii) endogenize communication and study what feedback individuals prefer to share with team members, and (iii) explore individuals' account for the selection of information by their teammates.

Our first contribution is to the literature studying the dynamics of overconfidence. Several studies examine how individuals respond to feedback. Some show evidence of asymmetric updating of beliefs in response to ego-relevant feedback, where good news is weighed more than bad news (Eil and Rao, 2011; Möbius et al., 2022). Such asymmetric updating can, for instance, be driven by image concerns (Bénabou and Tirole, 2002) or wishful thinking (*e.g.*, Mayraz, 2019). The evidence is mixed, however, with some studies finding no or an opposite asymmetry (*e.g.*, Coutts, 2019; Buser et al., 2018; Ertac, 2011; Gotthard-Real, 2017; Barron, 2021). We deviate from this literature in two major ways. First, our focus is on group confidence whereas existing studies are almost exclusively focused on individuals. Although group confidence is relevant because many decisions are made in groups, few studies experimentally investigated the role of confidence in team settings. The response to feedback can also be very different in groups since negative feedback does not necessarily hurt one's ego if other people are involved. Second, rather than exogenously generating feedback, we study how group members share performance feedback. Our focus is on the supply of information, whereas in individual contexts, others have studied the demand (or avoidance) of ego-relevant information. For instance, Burks et al. (2013) study the demand for feedback about performance on a cognitive test to identify social signaling roots of overconfidence, and Castagnetti and Schmackerz (2022) show evidence of motivated information selection and updating through the choice of less informative structures.⁷

The study closest to ours is Oprea and Yuksel (2022) who analyze the social exchange of motivated beliefs. In their experiment, subjects observe the reported confidence levels of group members who have the same ability level. The motivated assignment of accu-

⁷More generally, we note that the economic literature on within-team information sharing is remarkably thin. One theoretical study examines strategic disclosure in a team setting (Onuchic and Ramos, 2023) but in contrast to us, they study team disclosure choices to an external observer.

racy to others' beliefs amplifies the subjects' initial confidence bias. In the same spirit, [Cheng et al. \(2021\)](#) investigates the social transmission of overconfidence, showing that observing overconfident peers increases the individuals' bias when information is about in-groups. We share with these studies a similar interest in understanding whether the social exchange of ego-relevant information increases overconfidence and updating biases. We differ from them in several respects. First, in our ENDO treatment, subjects themselves choose whether to share informative ego-relevant signals with their teammates.⁸ Second, we focus on how individuals exchange verifiable signals rather than exchanging beliefs. Third, we manipulated the size of the groups to understand whether signal sharing and belief updating change when the sheer volume of information differs in the team. Fourth, we observe not only belief updating but also action in a group investment task in which success depends on the quality of belief updating in the team.

Related work also includes studies in which subjects can choose how confident to appear towards others. [Charness et al. \(2018\)](#) show how subjects strategically overreport their confidence to deter others from competing with them (see also [Schwardmann and Van der Weele \(2019\)](#) and [Solda et al. \(2020\)](#)). [Ewers and Zimmermann \(2015\)](#) find that subjects misreport their confidence to appear skilled towards others even when there is no strategic advantage, hence purely for image concerns. These settings differ from ours in the sense that we study a situation in which messages contain verifiable information rather than beliefs, and, in terms of monetary payoffs, incentives within a team are aligned rather than partially conflicting. These other studies also do not have a group task, nor do subjects have a choice in what kind of information to share.

More generally, our work is related to a large literature on the disclosure of verifiable information ([Milgrom, 1981](#); [Grossman, 1981](#)) and the lack of skepticism during communication (*e.g.*, [Benndorf et al., 2015](#); [Deversi et al., 2021](#); [Hagenbach and Perez-Richet, 2018](#); [Jin et al., 2021](#); [Penczynski et al., 2022](#)). Within that literature, relatively few studies focus on settings where confidence about one's ability plays a role, and incentives are typically partially conflicting. An interesting exception is the study by [Exley et al. \(2024\)](#) who find that students often choose to conceal harmful grades (grades lower than their GPA) but rarely do so when grades are neutral or helpful. In a different context, [Huber et al. \(2017\)](#) find that test-takers on online platforms are more likely to share performance feedback on social media when they receive higher scores. Finally, we contribute by exploring how individuals account for the selection operated by their team members when updating their beliefs about the strength of their team. [Enke \(2020\)](#) show that individuals fall often prey of a heuristic that consists of considering only the information that is shown to them without taking into account the fact that this information has been selected. More generally, inattention to missing information is not uncommon ([Brown et al., 2012](#); [Loewenstein et al., 2014](#)). In contrast to [Enke \(2020\)](#)

⁸This difference also explains that while [Oprea and Yuksel \(2022\)](#) need control treatments in which individuals do not observe their counterpart's beliefs or observe their beliefs about a non-ego-relevant outcome, we instead manipulate whether signal sharing is endogenous or exogenous.

we study selection neglect in the context of social information exchange.

3 Experimental Design and Procedures

In this section, we describe the main features of the experimental design. More details are in the Appendix. Our experiment employs a 2x2 between-subject design: we varied whether subjects could select which feedback to share with their team member(s) (treatment ENDO) or whether this was determined randomly (treatment EXO), as well as the group size (4 or 8 members). Table 1 provides an overview of the treatments.

Table 1: Treatment overview

Treatment label	Sharing decision	Groupsize	# Groups	# Subjects
EXO4	Random	4	13	52
ENDO4	Choice	4	12	48
EXO8	Random	8	12	96
ENDO8	Choice	8	12	96

3.1 Experimental Design

Figure 1 displays the timeline of the experiment that we describe below.

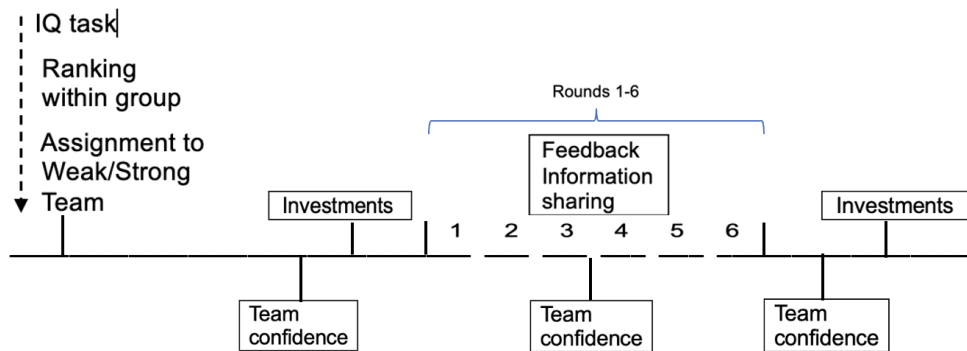


Figure 1: Timeline of the experiment

Preliminary Stage and Matching - In each session, we randomly formed *matching groups* of 4 or 8 subjects, depending on the treatment. All subjects first worked on an ego-relevant IQ test-type task that comprised 15 logical reasoning questions. They were given 8 minutes and could earn €1 for each correct answer if this part was randomly selected for payment. They were not informed of their performance at this stage.

Within a matching group, subjects were ranked based on their performance in the task. Each group was then split into two equally sized *teams*: the “strong” team and

the “weak” team. The top 25 percent of performers in a group were always put in the strong team, while the bottom 25 percent of performers were always put in the weak team. The middle 50 percent performers were divided equally over the two teams in a random manner. To each team, we also randomly assigned a “team number”, which could be low or high and was independent of the performance strength of the team. This team number was needed to generate neutral (*i.e.*, non-ego-relevant) signals in the next stage. The rules for assigning subjects to teams were made common knowledge but it was not revealed to subjects whether they were in the strong or weak team, or whether their team number was low or high.

Feedback Stage - The main stage of the experiment had 6 rounds. In each round, subjects privately received two signals: one performance-related and one performance-unrelated. The *performance signal* stated whether they ranked in the top or bottom half of their matching group (not their team). The *neutral signal* stated whether the team number was high or low and was unrelated to performance.⁹ Signals were informative but noisy: each signal was correct with 2/3rds probability.¹⁰ Signals were independently drawn for each subject and each round. These rules were made common knowledge. In each round, exactly one of the two signals was shared with their team member(s). In treatment ENDO, subjects could choose to share either the performance signal or the neutral signal. In treatment EXO, it was randomly determined which signal was shared (with equal probabilities).

Investments - Before and after the feedback stage, teams had the opportunity to invest money in two different bets. The *performance bet* paid 2.5 times the investment for the strong team; the weak team lost its investment. The *neutral bet* paid 2.5 times the investment if the team’s number was high, and the investment was lost otherwise. For each bet, subjects received a separate endowment of 600 cents.

Subjects privately indicated how much of the endowment they wanted to invest in each bet. To make it a team task, the actual investments in the performance and number bets were determined by the team average. This can make it costly to have team members with miscalibrated perceptions of their performance, making asymmetric information sharing potentially costly. To make the cost of asymmetric information sharing more sizeable, the performance bet was more likely to count for payments; if the investment stage was selected for payment, the performance bet would be implemented with an 80 percent chance and the neutral bet with a 20 percent chance.

We will refer to the investment choices before the feedback stage as “initial investments”, and to those after the feedback stage as “final investments”. To make subjects

⁹In the instructions for subjects, we referred to this as the ‘number signal’.

¹⁰Personnel economics has explained that companies frequently provide vague feedback to employees and keep individual evaluations confidential because of a willingness to promote motivation and cooperation among employees, and avoid discouragement or even sabotage (Villeval, 2020).

aware of the fact that sharing feedback asymmetrically can be costly, they were informed about the existence of the final investment stage before the feedback stage. The main purpose of the initial investments was to familiarize them with the task. The initial investment decisions in the number bet also serve as an individual control for risk attitudes.

Confidence - We elicited subjects' beliefs about being in the strong team, on a scale from 0 (certainly not in the strong team) to 100 (certainly in the strong team). Beliefs were elicited three times: before the feedback stage, after round 3, and after round 6 of the feedback stage. We will refer to those as "initial", "intermediate", and "final team confidence", respectively. We incentivized truthful reporting by using the scoring rule described in [Karni \(2009\)](#), with a potential bonus of €10.¹¹

Design Choices - We now elaborate on some of the design choices.

The main aim of our design was to allow subjects to share performance feedback asymmetrically. Our objective was to do this in a way that minimized potential experimenter demand effects. We believe that the introduction of a second signal (the neutral signal) achieves this. Since teams also benefit from sharing feedback about the team number, it provides a natural cover to not always share performance feedback.

A crucial element of our experiment is the ego-relevance of feedback that subjects receive and may share with teammates. To induce social image concerns, we told subjects that similar tasks are often used as part of intelligence tests. We also asked them to guess how high their team member(s) ranked (out of all subjects in the entire session), and told them that they would also learn at the end of the session how high they were ranked by team member(s). They could earn a €3 bonus for a correct guess. Finally, each team was identified by a color (blue or orange) to create feelings of team identity.

Like [Oprea and Yuksel \(2022\)](#), we opted for assortative matching in creating teams. In our case, the matching was imperfectly assortative: Higher ranked subjects in a group were more likely to be in the strong team, but not necessarily so. We did this so that subjects had aligned motives to believe that their team member(s) were ranked high, while still leaving room for some motivation to convince the team member(s) they were ranked high themselves, as team members could believe they ended up in the team by chance.

Note also that the private performance signals were related to the subject's rank in the matching group, rather than the team strength. A subject's rank and team strength are potentially different because subjects who ranked in the middle 50 percent were

¹¹Precisely, we first drew a random integer between 0 and 100. Each number was equally likely to be drawn. We compared this number to the subject's guess of being in the strong team. If the random number was higher than the guess, there was a lottery that paid the bonus with a chance that was equal to the random number. If the random number was lower than the guess, then we paid the subject the bonus if their team was really the strong one. The chance of getting the bonus is maximized by reporting truthfully.

randomly allocated over the teams. We opted for this to make the performance signal more ego-relevant.

3.2 Procedures

The project was pre-registered.¹² 292 subjects participated.¹³ Within each session, we varied the treatment (EXO vs. ENDO). Group size was varied between sessions.

The experiment was run in the CREED lab (Amsterdam). Participants were recruited from the CREED subject pool, consisting mostly of students. Their age ranges from 18-33 years (mean 21). 53 percent is female (see Table C1 in Appendix C for details on socio-demographic characteristics by treatment). Participants received all instructions on their screen (see screenshots in Appendix A). We provided them with paper and a pencil to take notes. To ensure that they read and understood the instructions, a test quiz was included at several points before the start of a new part. They could only continue after correctly answering all test questions. They could earn €1 for each time they correctly answered all questions in a quiz on their first attempt. At the end of each session, we included a brief questionnaire in which we asked for their age and gender. The software was programmed in PHP/MySQL. Sessions lasted about 50-60 minutes.

The program randomly selected one task for payment (the IQ task, one of the belief elicitations, one of the investment stages, or a guess about the ranking of team member(s)). If an investment stage was selected, it was randomly determined whether the performance bet (80 percent chance) or neutral bet (20 percent chance) was payoff-relevant. Earnings varied between €8 and €26 (M= €17.73, SD=4.36), including a fixed participation fee of €8.00. Each session had between 12 and 24 participants. As pre-registered, we first ran all sessions with small groups before running the sessions with large groups.

3.3 Hypotheses

We pre-registered three main hypotheses.

First, we anticipated that individuals are selective in how they share own performance feedback with their team member(s). This is based on the results of the previous literature showing that ego-utility and social image are important elements of human motivation in various settings (Bénabou and Tirole, 2002, 2006; Köszegi, 2006; Bursztyn and Jensen, 2017). In our experiment, ego-utility and social image push individuals to share the performance signal when it is positive, and share the neutral signal instead

¹²See <https://aspredicted.org/C24.CHG>

¹³Before running the reported sessions, we ran pilot sessions to test the software and the understanding of the instructions. As described in the pre-analysis plan, the data from those sessions were never meant to be included in the analysis. We also experimented with a different design, in which subjects received multiple performance signals and could only share one of the signals. Since they often received only positive or only negative feedback, they could not share feedback in a biased manner, which is why we adapted the design.

of the performance signal in case the performance signal is negative. As a result, we expect that overall individuals share more positive than negative performance signals.

Hypothesis 1. (*Asymmetric information sharing*): *Individuals are more likely to share positive performance feedback than negative performance feedback with their team members.*

Second, we anticipated that the selective sharing of performance feedback, if observed, would increase the belief that the individual belongs to a strong team. This results from the fact that even individuals who update beliefs based on their own performance signals in an accurate Bayesian way may naively take the signals shared by their team member(s) as an unbiased sample and thus not fully correct for a possible bias in their information disclosure (see the literature review on the limited skepticism in disclosure games and, in particular, [Dranove and Jin, 2010](#); [Brown et al., 2012](#); [Enke, 2020](#); [Jin et al., 2021](#); [Hagenbach and Saucet, 2022](#)). This may be further aggravated if individuals have motivated reasoning such as wishful thinking about the future investment. As a result of higher confidence, we also expect to see that investments in the performance bet are higher in treatment ENDO compared to treatment EXO.

Hypothesis 2. (*Team delusion*): *Asymmetric information sharing results in higher (over) confidence at the team level compared to exogenous information disclosure.*

Note that our benchmark is the EXO treatment, in which it is randomly selected which feedback is shared. We believe that this is a natural benchmark, but other benchmarks are possible. For instance, players could follow a strategy to share performance feedback when it is positive and neutral feedback otherwise. Compared to what happens in EXO, this allows for more information transmission: a neutral signal can be shared each time that the performance feedback is negative, and the absence of positive performance feedback implies that the performance feedback was negative.¹⁴

Finally, we anticipated that team overconfidence (and thus, investment in the performance bet) would be higher in larger teams. Indeed, individuals may have stronger image concerns when more team members can observe their performance signals. Therefore, they may be more selective when sharing information in larger teams than in smaller ones. Furthermore, with larger teams, more information is shared. While this could in principle help improve calibration, we anticipate that the asymmetric information sharing will make it worse, as we expect that positive feedback will be excessively shared and it may be more complicated to correct for the selection made by more team members.

Hypothesis 3. (*Team Size*): *(Over)confidence increases in team size.*

¹⁴If performance feedback is more likely to be negative than positive, it would be better to only share performance feedback when it is negative.

4 Results

Throughout this section, we take the matching group as the independent unit of observation for statistical testing, unless we split by strong versus weak teams, in which case the team will be treated as the independent unit of observation. We start by pooling the two team size conditions together and examine the effect of team size in subsection 4.4. Non-parametric tests are two-tailed, except when specified otherwise. Unless explicitly stated otherwise, our analysis in this section follows the pre-registration plan.

4.1 Information Sharing Behavior

In treatment ENDO, subjects choose which feedback to share: the performance signal or the neutral signal. Overall, they share the performance signal 54 percent of the time.

To determine an asymmetry in the sharing of feedback, we use the following measure. Each participant receives a performance signal (s_p^j) and a neutral signal (s_n^j), where $j \in \{+, -\}$ indicates whether the signal is positive ("top" or "high") or negative ("bottom" or "low"). If $\lambda(s_i^j)$ is the proportion of times that the performance signal is shared given the signal s_i^j , then the level of asymmetry is measured as:¹⁵

$$b_i = \lambda(s_i^+) - \lambda(s_i^-). \quad (1)$$

Figure 2 shows the fraction of times that the performance signal is shared for each possible neutral signal (left) and for each performance signal (right). Since the team number is unrelated to performance and, thus, not ego-relevant, we do not expect that the sharing decision depends on the feedback about the number. We indeed cannot reject that the percentage of times that the performance feedback is shared is equal for a low and a high neutral signal (54 percent in each case, signed rank test, $p = .950$).

By contrast, we find strong evidence of asymmetric information sharing when it comes to performance feedback. The performance feedback is shared 68 percent of the time when it was positive, compared to only 40 percent of the time when it was negative. The difference is large (28 p.p.) and significant (signed rank test, $p < .001$). We find it for strong teams (difference 28 p.p., $p < .001$) as well as for weak teams (difference 29 p.p., $p < .001$). The result is also robust to adding score, round effects, and demographics as controls in the regression analysis (see Table C2 in Appendix C). This analysis supports Hypothesis 1.

Result 1. *Subjects share ego-relevant feedback in an asymmetric manner: positive performance feedback is shared more often than negative performance feedback.*

¹⁵ Notice that we report the degree of asymmetry in information sharing at the population level. Alternatively, we could first determine the asymmetry at the individual level, and report the mean of the individual level of asymmetry. These two approaches can differ slightly because not every participant receives the same number of positive and negative signals. None of our results change qualitatively if we use the latter approach. Moreover, we report in subsection 4.1 an exploratory analysis of heterogeneity in the asymmetry of information sharing measured at the individual level.

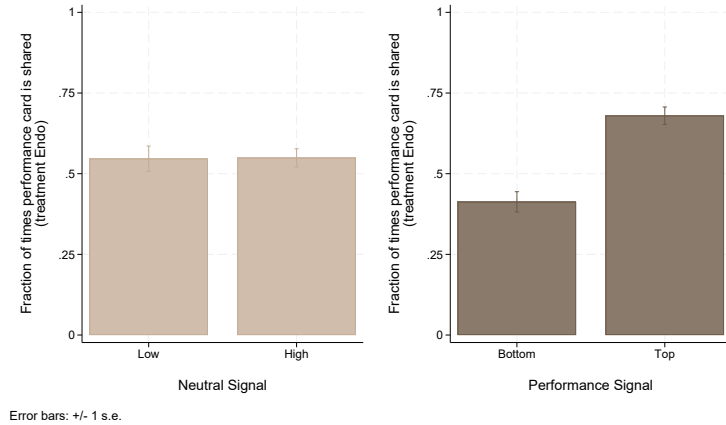


Figure 2: Feedback shared by signal

Notes: The figure displays the fraction of times that subjects share the performance card in treatment ENDO. Error bars indicate ± 1 s.e., taking the group average over all rounds as the independent unit of observation.

Note that, even though feedback is shared asymmetrically, negative feedback is still frequently shared. Possible reasons for this include the concern for the investment decision, an aversion to deceive others, or a need to maintain some level of credibility. In the concluding section, we discuss this in more detail.

4.2 Team Confidence

The average number of correct answers on the IQ test-type task is 9.3 and there is no treatment difference between ENDO and EXO (Kolmogorov-Smirnov test, $p = .442$). The initial belief of being in the strong team correlates positively with performance on the task ($\rho = .386$, $p < .001$). Consistent with earlier studies on individual confidence (*e.g.*, Moore and Healy, 2008; Charness et al., 2018; Oprea and Yuksel, 2022), we find evidence of overplacement in a team context. The mean reported prior belief is 66 (that is, 66 percent chance of being in a strong team), and only 8.9 percent of subjects report a belief below 50. Confidence is significantly higher for subjects in strong teams than in weak teams (69.8 versus 62.2, $p < .001$) but even in weak teams only 15.1 percent of subjects report a confidence below 50.

Initially, before the feedback stage, there is no treatment difference in beliefs between treatments ENDO and EXO. The average initial belief is 65.7 in EXO and 66.3 in ENDO, and the difference is not significant (rank-sum test, $p = .762$).¹⁶ After getting feedback, beliefs start to diverge across treatments. Final beliefs are on average 10.4 percentage points higher in ENDO than in EXO, and the difference is significant (rank-

¹⁶Since there has been no interaction between participants at this point, we can treat each subject as an independent observation. This yields an almost identical p -value of .748. A Kolmogorov-Smirnov test also does not reject that the distributions are equal ($p = .998$).

sum test, $p = .007$). Surprisingly, this is not because team confidence increases in ENDO, but because team confidence *decreases* in EXO. In ENDO, confidence stays high, and final confidence (64.4) is not significantly different from the initial belief (signed rank test, $p = .306$), despite asymmetric information sharing. In EXO, on the other hand, confidence decreases to 54.0, significantly below the initial belief (signed rank test, $p = .001$), in response to the imperfect but unbiased signals received in this treatment.¹⁷

Figure 3 shows the evolution of beliefs by team strength. Confidence declines in EXO as subjects get more feedback, both for weak and strong teams. In ENDO, the decline in confidence is less strong (weak teams) or absent (strong teams).¹⁸ Thus, relative to EXO, teams in ENDO end up being more confident after the feedback stage. The difference is significant for weak teams (13.7 p.p., rank sum test $p = .009$) but not for strong teams (7.0 p.p., $p = .430$). Note that, because of its noisy nature, feedback can differ slightly between treatments. After controlling for the number of positive performance signals about own performance, we find a significant treatment effect for both weak and strong teams, with a comparable point estimate of about 10 percentage points (see columns (4)-(6) in Table 2).¹⁹ For weak teams, but not strong teams, the gap is already there after 3 rounds (see columns (1)-(3) in Table 2). This analysis supports Hypothesis 2.

Result 2. *Relative to exogenous sharing of feedback, asymmetric information sharing results in higher team confidence.*

4.3 Investments

We next examine if higher confidence translates into larger investments in the performance bet by teams. Panel A in Table 3 reports the investments of all teams in the performance bet before and after the feedback stage. Investments in the performance bet decline under exogenous information sharing, whereas investments slightly increase with endogenous information sharing. After the feedback stage, teams invest on average 53 units (out of 600) more in ENDO than in EXO. Using a one-sided test (as pre-registered), this difference is significant at the 5 percent level. Note that already before the feedback stage investments differ somewhat between treatments. Although not pre-registered, it thus seems natural to look at the difference-in-difference (DID) estimate in which the initial investment is used as a control. The DID estimate is 73 and highly significant ($p < .001$, two-sided test).

¹⁷Results are very similar if we focus on the participants who were ranked in the middle and were randomly allocated to the weak or strong team. Within that sample, initial confidence is 66.9 (EXO) and 66.6 (ENDO) and final confidence is 51.6 (EXO) and 63.4 (ENDO).

¹⁸The difference between the posterior and the prior beliefs is significant in EXO for weak teams ($p = .002$) but not for strong teams ($p = .150$). In ENDO, the difference is not significant for either weak teams ($p = .145$) or strong teams ($p = .950$).

¹⁹We do not include the signals received from the teammate(s) in these regressions because shared feedback is endogenous in the treatment.

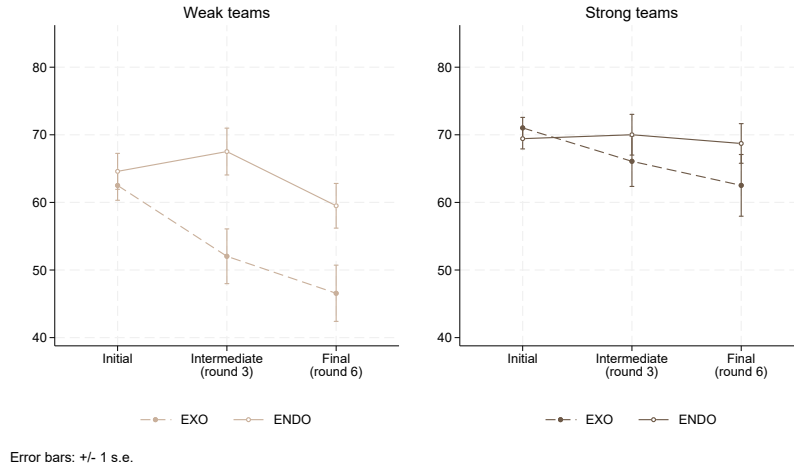


Figure 3: Team confidence, by treatment and team strength

Error bars indicate ± 1 s.e., taking the team average as the independent unit of observation.

Splitting by team strength, we find similar patterns for weak and strong teams (panels B and C in Table 3). Investments tend to decrease in EXO and increase in ENDO. The effect is mainly driven by weak teams, with a DID estimate of 108, significant at the 5 percent level. For strong teams, there is no significant difference between EXO and ENDO.

Whether or not increased investments are beneficial depends on the team's strength. In terms of expected earnings, strong teams benefit from investing more in the performance bet, while for weak teams investing is detrimental. The asymmetry in feedback sharing lowers the earnings of weak teams by roughly 25 percent ($81/(600-274)$).

Result 3. *Relative to the exogenous sharing of information, asymmetric information sharing results in higher investments in the performance bet. Even weak teams increase their investments, resulting in worse decision-making by weak teams in terms of expected earnings.*

4.4 Team Size

We hypothesized that team confidence would increase in team size. We find asymmetric information sharing for both team sizes, with similar degrees of asymmetry. Small teams are 26 percentage points more likely to share performance signals when the signal is positive than when the signal is negative (signed rank test $p = .001$). For large teams, the difference is 29 percentage points ($p < .001$). There is no significant difference in the size of the asymmetry between small and large teams ($p = .124$, rank-sum test).

Subjects in larger teams receive more positive performance feedback from their team members, simply because there are more team members. Nevertheless, we find little

Table 2: Team Confidence

DV: Belief to be in a strong team	(1)	(2)	(3)	(4)	(5)	(6)
	Intermediate Beliefs			Final Beliefs		
	All	Weak	Strong	All	Weak	Strong
Treatment ENDO	8.633*** (3.126)	14.657*** (4.792)	3.509 (3.684)	9.584*** (3.135)	10.875** (4.799)	9.515** (4.232)
# pos. perf. signals	9.111*** (1.694)	6.266** (2.338)	11.985*** (2.407)	5.593*** (0.904)	3.680** (1.392)	6.552*** (1.768)
Initial belief	0.561*** (0.090)	0.646*** (0.108)	0.314** (0.122)	0.502*** (0.091)	0.523*** (0.111)	0.377** (0.153)
Constant	8.010 (5.938)	2.335 (6.825)	24.090** (9.094)	4.332 (5.872)	4.719 (7.499)	12.255 (11.686)
Observations	292	146	146	292	146	146
R-squared	0.323	0.391	0.254	0.261	0.251	0.200

Notes: This table reports the estimates from a linear probability model. The dependent variable is the belief to be in the strong team (0-100). Models (1) to (3) are for the beliefs elicited in round 3 and models (4) to (6) are for those elicited in round 6. Robust standard errors in parentheses are clustered at the matching group level. “# pos. perf. signals” represents the total number of positive performance signals received by the subject up to the round in which beliefs are elicited. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

support that confidence increases with team size as a result of asymmetric information sharing. In ENDO, final beliefs are 63.3 for small groups and 64.9 for large groups. The difference in small and not significant (rank sum test, $p = .504$).²⁰

For small teams, the difference in final beliefs between EXO and ENDO is 7.3 percentage points, whereas for large teams the difference is 12.0 percentage points. To test for a difference in these gaps, column (1) of Table C3 in Appendix C regresses final beliefs on the treatment and team size, including an interaction effect. For small teams, there is no significant treatment effect of being in ENDO. For large teams, the treatment effect is significant (see the bottom row of the table where we report p-values for the joint significance of the coefficients of treatment ENDO and the interaction effect). The interaction effect itself is positive but not significant, providing only weak support that team size amplifies the effect of asymmetric feedback sharing. We reach the same conclusion if we focus on changes in beliefs, using initial beliefs as individual controls (see column (2) of Table C3), or if we focus on (changes in) investments in the performance bet (see Table C4 in which we consider the average team investment). Overall, we do not find strong evidence to support Hypothesis 3.

²⁰Note that subjects in large teams performed on average slightly worse than small teams (9.1 vs. 9.7 correct answers on average). A t-test yields a p-value of $p = .017$ but a Kolmogorov-Smirnov test indicates no significant difference with a p-value of $p = .146$). Results reported in Table C3 in Appendix C on confidence and team size are robust against including performance as control.

Table 3: Investments in the Performance Bet

	Investment pre	Investment post	Δ
<hr/> Panel A: All <hr/>			
EXO	363	314	-49*** (.004)
ENDO	347	371	24* (.080)
Δ	-16 (.466)	57* (.088)	73*** ($<.001$)
<hr/> Panel B: Weak teams <hr/>			
EXO	354	274	-80*** (.003)
ENDO	327	355	28 (.320)
Δ	-27 (.407)	81* (.062)	108** (.012)
<hr/> Panel C: Strong teams <hr/>			
EXO	372	353	-19 (.399)
ENDO	368	386	18 (.267)
Δ	-4 (.909)	33 (.472)	37 (.298)

Notes: p-values for two-sided tests in parentheses (rank-sum test for comparison between treatments, signed rank test for comparison between rounds). The unit of observation is a group (Panel A) or team (Panels B and C).

Result 4. *Team size does not affect the level of asymmetry in performance feedback sharing, and there is no strong evidence that large teams are more confident or invest more in the performance bet.*

5 Additional Results

This section reports some (non-preregistered) exploratory analyses.

5.1 Evolution of Information Sharing Over Time

Besides learning from feedback, participants could also change their information-sharing strategy over time. We do not find evidence of this. As visible in Figure 4 (right), the performance feedback is systematically more often shared when the performance feedback is positive than when it is negative. This gap is already present in the first

round and remains stable over the rounds except for the very last round. This slight decrease in the share of positive performance signals in the last round could be explained by the expectation of a ‘pratfall effect’ according to which a weakness can increase the attractiveness of a competent individual (Aronson et al., 1966). By contrast, whether the performance feedback is shared is unrelated to the neutral signal throughout the game (Figure 4 left).

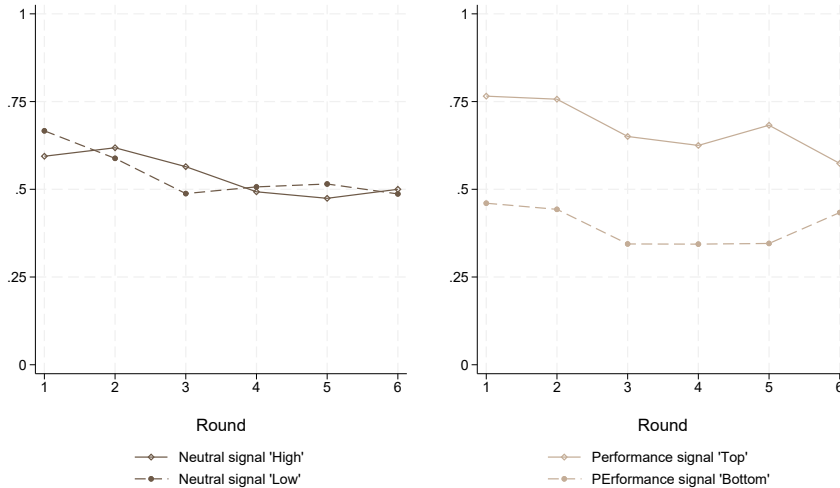


Figure 4: Fraction of times that the performance feedback is shared, by round and feedback, depending on the neutral signal (left panel) and the performance signal (right panel).

5.2 Heterogeneity in Information Sharing

In this sub-section, we examine if there is heterogeneity in the information-sharing asymmetry in the treatment ENDO, and whether this is correlated with outcome variables. To this purpose, we construct an asymmetry index using the same measure as introduced earlier in equation (1), computing it separately for each participant in treatment ENDO. We exclude 14 participants who never got negative performance feedback or never got positive performance feedback. We indeed find evidence of heterogeneity. The observed index ranges from -1 (participants who only share performance feedback when it is negative) to +1 (participants who only share performance feedback when it is positive). On average, the index is .33 (s.d. .469).²¹ About 21 percent of participants display no asymmetry. Only 15 percent have a negative asymmetry ($b_p < 0$) and the remaining 64 percent show a positive asymmetry ($b_p > 0$).

We find no correlation between the level of asymmetry of a participant and that

²¹As explained in footnote 15, this number differs slightly from the 28 p.p. reported earlier, because not all subjects get the same number of positive and negative performance signals.

participant’s final confidence or investment in the performance bet. In both cases, the correlation is positive but low ($\rho < .1$, Pearson’s correlation coefficient) and not significant ($p > .439$). There is also no strong correlation between the size of b_p and the initial or final investment in the neutral bet ($\rho < .1$, $p > .370$) The only relation to the individual’s level of asymmetry that we find, is that participants with a higher b_p report a higher initial confidence ($\rho = .230$, $p = .008$). Gender differences are discussed in detail in Section 5.5.

5.3 Updating of Beliefs on the Team’s Strength

Several papers have studied confidence updating in an individual context (see, *e.g.*, [Eil and Rao, 2011](#); [Ertac, 2011](#); [Coutts, 2019](#); [Möbius et al., 2022](#)). Our setting is less suited to study belief updating for two reasons. First, we only elicited confidence levels after three consecutive rounds. In the span of those 3 rounds, participants received multiple, possibly conflicting, signals; so, we cannot identify the effect of a single signal. Second, we gave subjects feedback about their rank in their group rather than about their team strength. Consequently, in the Bayesian benchmark, the posterior belief is not a linear function of the signals and the prior, even after transforming the beliefs in terms of their log odds. We nevertheless believe it is insightful to examine how confidence depends on the signals received.

Table 4 reports the results from a linear regression. In Panel A, we estimate the logit of posterior beliefs ($\hat{\rho}$) held by individual i in the matching group k in rounds 3 and 6 ($t = 3, 6$). The explanatory variables are the feedback received in the three rounds before (number of positive and negative performance signals) and the logit of prior beliefs.

$$\text{logit } \hat{\rho}_{i,t} = \beta_1 \sum_{\tau=t-3}^t s_{p,i,\tau}^+ + \beta_2 \sum_{\tau=t-2}^t s_{p,i,\tau}^- + \delta \text{logit } \hat{\rho}_{i,t-2} + \epsilon_{i,t,k},$$

In Panel B, we do the same for feedback shared by team members, which can also be neutral signals (where we do not make a distinction between positive and negative signals):

$$\text{logit } \hat{\rho}_{i,t} = \beta_3 \sum_{\tau=t-2}^t \sum_{j \neq i} s_{p,j,\tau}^+ + \beta_4 \sum_{\tau=t-2}^t \sum_{j \neq i} s_{p,j,\tau}^- + \beta_5 \sum_{\tau=t-2}^t \sum_{j \neq i} s_{n,j,\tau} + \delta \text{logit } \hat{\rho}_{i,t-2} + \epsilon_{i,t,k},$$

Analyzing own and team members’ feedback separately and following [Möbius et al. \(2022\)](#) in not estimating a constant allow for an easy interpretation in which the coefficients of the different types of feedback can be directly compared.

Participants predictably respond to feedback about themselves: positive feedback increases confidence and negative feedback decreases confidence, with no clear evidence

Table 4: Confidence and feedback

	(1)	(2)	(3)	(4)
DV: Logit confidence	EXO4	ENDO4	EXO8	ENDO8
PANEL A: Feedback own				
# positive performance signals	0.222*** (0.063)	0.341*** (0.058)	0.239** (0.107)	0.408*** (0.057)
# negative performance signals	-0.381*** (0.107)	-0.139** (0.054)	-0.324*** (0.064)	-0.095 (0.057)
logit prior belief	0.975*** (0.052)	0.574*** (0.070)	0.753*** (0.104)	0.641*** (0.057)
PANEL B: Feedback team members				
# positive performance signals	0.266* (0.146)	0.239*** (0.059)	0.248** (0.090)	0.248*** (0.040)
# neutral signals	-0.042 (0.124)	-0.041 (0.061)	-0.009 (0.059)	0.039 (0.033)
# negative performance signal	-0.467*** (0.106)	0.157 (0.126)	-0.283*** (0.045)	-0.291*** (0.032)
logit prior belief	1.007*** (0.048)	0.617*** (0.075)	0.707*** (0.107)	0.688*** (0.071)
Observations	104	96	192	192

Notes: OLS estimates, pooled over rounds 3 and 6. Panels A and B are separate regressions. Robust standard errors clustered at the matching group level. The dependent variable is the belief about being in the strong team in terms of log odds, *i.e.*, $\ln(\text{belief}/(100-\text{belief}))$. Beliefs of 0 and 100 are recoded as 1 and 99, respectively. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

of asymmetric updating except in large teams in the treatment ENDO. When it comes to feedback from team members, we again tend to see that positive performance feedback increases confidence and negative feedback decreases confidence, except for ENDO4 where negative feedback shared by team members has a positive (but not statistically significant) effect. Perhaps most interesting is the response to neutral signals. In EXO, getting a neutral signal instead of a performance signal is uninformative about performance and, hence, should be treated as worse than a positive signal and better than a negative signal. We find this for both group sizes. In ENDO, a neutral signal tends to mask negative performance feedback. We do not find evidence that neutral signals are treated as negative news (even though they should be) and this may be the reason that high confidence levels are maintained in ENDO.

5.4 Investments and Feedback

We implicitly posited a link between confidence and investments in the performance bet. We indeed find a strong correlation in each treatment ($\rho > .63$, $p < .001$, Spearman

rank correlation). Looking more into detail, we find that investments in the performance bet depend predictably on performance feedback: more positive performance feedback increases investments, and positive (negative, respectively) performance feedback shared by team members also increases (decreases, respectively) investments (see column (1) of Table C5). Reassuringly, feedback about the neutral signal has no significant impact on investments. For investments in the neutral bet, we find the opposite: neutral signals are strongly correlated with investments, while performance signals are not predictive (Table C5 column (2)).

5.5 Gender differences

Many studies have documented gender differences in reported confidence levels (*e.g.*, Barber and Odean (2001); Charness et al. (2018); Möbius et al. (2022)). In line with this, we find that initial confidence is higher for males than for females (68.6 vs. 63.8, $p = .020$, two-sided rank-sum test).²² It is therefore natural to look for evidence of gender differences in other respects.

We do not find a gender difference in information-sharing asymmetry. Males are 29 percentage points more likely to share positive performance feedback than negative performance feedback; for females, the difference is 28 percentage points. For each gender, we can reject that there is no asymmetry ($p < .001$, sign rank test), and the difference across genders is not significant ($p = .224$, rank sum test).²³ Consistent with this, the interaction effect between being a female and sharing positive performance feedback is small and insignificant (see column (4) in Table C2 in Appendix C). We also do not find strong evidence of gender differences in final beliefs. After the feedback stage, males are about 12 percentage points more confident in treatment ENDO than in treatment EXO. For females, the difference is 8 percentage points. Column (1) in Table C6 in Appendix C reports the results from regressing the treatment on final beliefs, including an interaction term between the treatment and gender. The coefficient of the interaction term is small and not significant.

Females are initially more reluctant in their investment choices. On average they invest 58 less in the performance bet than males ($p = .001$, rank-sum test). This is consistent with their lower reported confidence. This result is robust against controlling for differences in risk attitudes (see column (2)). We find similar patterns in investments across time between genders. Investments in treatment EXO decrease, while investments in ENDO increase. The effect is less pronounced for females, with a difference-in-difference of 48 for females against 106 for males. The gender difference is not significant

²²In this section, we take an individual as the unit of observation.

²³The existence of a gender difference in sharing knowledge or information is debated. Studying advice within teams on strategic play in signaling games, Cooper and Kagel (2016) found that females were much less likely than males to provide advice to their team members. In their study, Exley et al. (2024) found a gender difference in the concealment of grades, with females being somewhat more reluctant to conceal harmful grades compared to males.

though, as can be seen from the interaction effect in columns (3) and (4) of Table C6 in Appendix C.

6 Discussion and Conclusion

Anecdotal evidence shows that groups sometimes make mistakes that may entail dramatic losses. We explored in this study whether group delusion could explain such efficiency losses deriving from wrong team decisions. The mechanism we tested experimentally is that individuals tend to share feedback on their performance in an ego-relevant task with team members in an asymmetric way; if team members take the signals shared by others *prima facie* without correcting for the information they cannot see, such selective information transmission may wrongly increase team confidence and lead weaker teams to take inferior decisions. By focusing on how the social exchange of information impacts team overconfidence, we complement the past studies on the rationality of teams that mainly considered games in which there was no communication of ego-relevant information (e.g., beauty contests, risk-taking tasks, prisoner dilemmas, hide-and-seek games).

Our main findings show that, in our experiment, team members do share ego-relevant information asymmetrically and tend to hide negative performance feedback from others. This finding is particularly striking given that this behavior emerged in an anonymous “cold” environment where individuals could not be personally identified by other players. We can anticipate that image concerns, and thus the asymmetrical sharing of information, would be even more pronounced if subjects could identify each other. Furthermore, additional motives might reinforce the asymmetric sharing of ego-relevant information in natural settings where employees’ jobs could be at risk. Therefore, our result likely represents a lower bound of this effect.

In our study, this selective ego-relevant information sharing does not induce an increase in team overplacement but prevents the downward adjustment of beliefs made possible when team members receive unbiased performance signals. This is consistent with the notion of selection neglect, whereby individuals tend to ignore the signals they did not receive from others (Enke, 2020). As a result, asymmetric information sharing worsens weak teams’ decision-making in terms of expected earnings relative to exogenous information sharing, without improving the quality of strong teams’ decisions.

Somewhat surprisingly, despite receiving mostly positive feedback on their own performance, strong teams become on average less confident after receiving feedback in the treatment with exogenous feedback sharing. Possibly, this can be explained by the fact that confidence was about the team and performance matching was imperfectly assortative (in contrast with Oprea and Yuksel, 2022). The fact that a lower-ranked subject could be assigned to the strong team meant that negative feedback was received and shared even in strong teams. At the same time, this made it easier for subjects to admit

that they may not be in the strong team, as they could attribute it to the weak performance of their team member(s) while maintaining high confidence about their own performance. For teams that consisted only of subjects ranked in the top half, there was a slight increase in confidence (from 70.1 to 71.6).

One could also wonder why subjects in the experiment did not only share positive performance signals with their team members to increase their social image. There are at least three possible explanations (not mutually exclusive) for why individuals sometimes decide to share bad news about their performance. The first one is the cost of possibly misleading their partners. If the shared signals lead partners to become excessively confident about the team's strength, these partners may wrongly invest in the performance bet, with negative monetary consequences for all team members. The second possible explanation is the willingness to maintain a certain level of credibility because of reputation concerns *vis-à-vis* co-players: individuals may fear looking suspicious in their partners' eyes if they report only good news on their performance. The third one is a preference for truth-telling, as identified in the context of lying behavior (see, *e.g.*, [Gneezy, 2005](#)): subjects in our study may feel that they would violate their ethics by sharing only good news with their team members when they have received more balanced performance feedback.

Although we do not want to overgeneralize our findings, they suggest some implications for organizations. In particular, if companies are willing to keep individual performance feedback private to limit inter-individual rivalry, giving public collective performance feedback to teams would limit the detrimental effects of both the selective sharing of ego-relevant information by individuals and the naive interpretation of the potential asymmetry in signals shared by team members. Beyond this, our findings question how individuals see failures when performing tasks. Seeing failures as opportunities to learn and improve rather than as a source of decreased status might reduce the asymmetry in performance information sharing.

Several extensions of this study could be thought of to better understand the mechanism driving the selective sharing of information. In particular, it would be interesting to disentangle the role of social image from that of wishful thinking in the perspective of the investment decision. This could be done by removing the investment stage in our experiment. It would also be worthwhile to study how both the asymmetry in sharing feedback and confidence evolve with more repetitions. Subjects may learn to play and interpret different strategies. Moreover, it would be interesting to compare the impact of the exchange of information on members' performance on team overconfidence (as in our current study) with the exchange of beliefs on being in a strong team. Another extension could be to introduce salient group identities to test how this would affect the selective sharing of information. On the one hand, group identity would probably strengthen image concerns; on the other hand, this might also increase reputational concerns on the honest revelation of information. Furthermore, would introducing a

hierarchy attenuate or reinforce the selectivity of information sharing? From that respect, it would be interesting to seek evidence of the asymmetry in information sharing in the field and test its sensitivity to various organizational settings. Are organizations with more vertical hierarchies more likely to be affected by such asymmetric information sharing? Are those investing more in continuous training of their employees less affected?

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Appendix

A Experimental Instructions

Below are the instructions used for sessions with a groupsize of 4. Treatment specific instructions are indicated with [Treatment ENDO] or [Treatment EXO]. Appendix B contains some screenshots. Correct answers to quiz questions are underlined here but not in the actual experiment.

Instructions.

Thank you for participating in this study. Please read all the instructions carefully. If you have any questions during the experiment, please raise your hand and an experimenter will come to you to answer your question in private.

You will receive a guaranteed payment of €8 for completing the study. On top of this, you can earn a substantial bonus.

The study consists of 6 parts, followed by a short survey. At the start of each part, we explain how you can earn money. At the end of the study, one part will be randomly selected for actual payment (rounded to 10 cents).

On the next pages, you will see the description of your task for the first part.

Instructions for Part 1

Your task. Part 1 consists of 15 questions. **These questions measure your ability to reason in a logical way and such questions are often used as a measure of intelligence.**

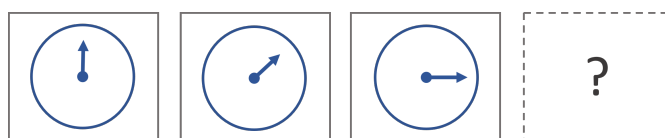
Later on, you will get some feedback on your performance. This feedback is sometimes also shared with other participants, but you will remain anonymous (your cubicle number remains hidden to other participants). There will also be a part in which there is an investment opportunity that pays more when your performance on the test is better.

Your payment. If this part is randomly selected for payment, then you get a **bonus payment of €1.00 for each correct answer.**

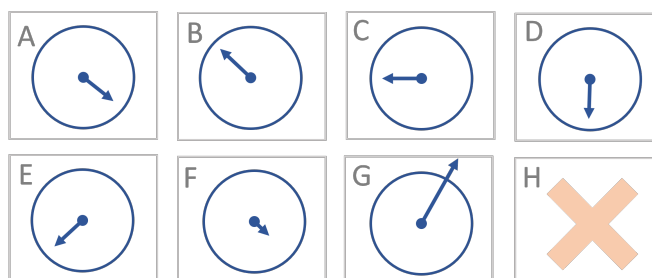
On the next page you will see an example question.

Below is an example of the type of questions that you will get.

You will see a series of figures that follow a logical pattern. One figure still has a question mark. Your task is to select the figure that logically fits at the position of the figure with the question mark.



You can select your answer from the answer options that are provided below the question. The correct answer in this example would be answer A. The logical pattern is that the arrow rotates by 45 degrees clockwise in each next figure.

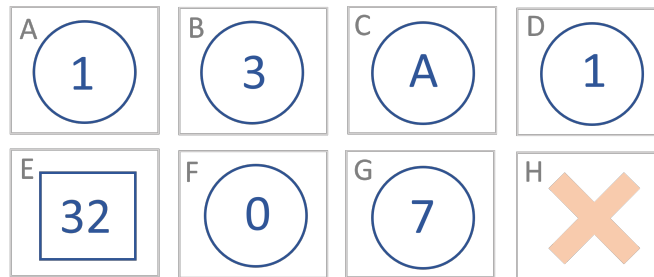


Sometimes none of the provided answers completes the pattern in a logical manner. In that case, you should select the answer that has a cross.

For instance, in the example below, the logical pattern is that there is a number in a circle, and the number doubles in each step. The missing figure should also have a circle, with the number 32.



None of the figures in the answer options fits the pattern. Answer E has the right number, but the shape around it is not a circle. The correct answer is therefore answer H.



There is a time limit of 8 minutes and there are 15 questions.

You can skip a question, but you cannot go back to a previous question.

Remember, you will get €1.00 for each correct answer. There is no penalty for incorrect answers.

Each participant will get the same 15 questions.

Instructions for Part 2

For this and the following parts, we have randomly formed groups of 4 people.

Based on the performance on the IQ test, we have ranked the 4 people in your group from best (rank 1, most correct answers) to worst (rank 4, fewest correct answers). Ties are resolved randomly.

Within your group of 4 people, we then formed two teams: the **strong team** and the **weak team**. Higher ranked people are more likely to be in the strong team but not always. The strong team always consists of the person ranked 1 (the best performer) and either the person ranked 2 or ranked 3 (determined randomly). The person with the worst performance (rank 4) is never in the strong team.

We will call your team "Team Orange" and the other team "Team Blue". We will not tell you if your team is the strong or the weak team.

You will stay in the same group (of 4 people) and the same team (of 2 people) for the remainder of this study.

Your task. We will ask you to estimate the chance that Team Orange (your team) is the strong team.

You can indicate your estimate on a scale from 0 to 100. An estimate of 0 means that you are certain that your team IS NOT the strong team. An estimate of 100 means that you are certain that your team IS the strong team. An estimate of 50 means that you think it is equally likely that your team is the strong team or the weak team. You can also indicate any other number between 0 and 100.

Your payment. If this part is selected for payment, **you can earn a bonus of €10.** The rule that determines your bonus payment is set up in such a way that **you maximize the chance to get the bonus if the estimate that you report is what you truly believe.** If you wish to know more about the rule, you can [click here](#).

On the next page, there will be some quiz questions to test your understanding of the instructions. If you answer them correctly on your first attempt, you will earn an additional bonus of €1.

Quiz questions were: 1) Will your group and team stay the same throughout the study? (Yes/No), 2) Which statement is correct? (Any participant can be in the strong team/The lowest ranked participant can never be in the strong team/The strong team always consists of the 2 highest ranked participants), 3) What will you be asked to estimate? (The chance that you are in the strong team/The chance that you are in the weak team/The chance of being the highest ranked member of your team).

Instructions for Part 3

In this part, there will be two investment opportunities. The investments are bets that will either pay 2.5 times the amount invested (minus the investment) or nothing.

Bet 1: The Team Performance bet. This bet is related to your team performance on the IQ test. This bet pays 2.5 times the amount invested if **Team Orange is the strong team.** You will lose the investment if Team Orange is the weak team.

Bet 2: The Number bet. This bet is related to a random number. The computer randomly assigned a number to your team. The team number can be high (100) or low (0). A high or low number are equally likely and independent on your performance on the IQ test. This bet pays 2.5 times the amount invested **if the number is high.** You will lose your investment if the number is low.

The two bets are unrelated to each other. Only the Team Performance bet will depend on your performance on the IQ test.

Your task. You will receive a separate budget of 600 cents for each of the bets. For each bet, we ask you to indicate how much of the endowment you want to invest in that bet. You get to keep the amount that is not invested.

Your payment. If this part is selected for payment, one of the bets will be implemented. With 80 percent chance the Team Performance bet will be implemented, and with 20 percent chance the Number bet will be implemented.

The investment will be a joint decision by all team members. Each of you individually decides how much you want to invest. The actual amount invested will be the average investment chosen by all team members.


On the next page, there will be some quiz questions to test your understanding of the instructions. If you answer them correctly on your first attempt, you will earn an additional bonus of €1.


Quiz questions were: 1) An investment in the Team Performance Bet pays money if: (Your team is the weak team/Your team is the strong team, 2) An investment in the Number Bet pays money if: (Your team got a low number/Your team got a high number), 3) Which statement is true about the team number? (A high number is more likely if your team is the strong team/It is random and equally likely to be high or low).

Instructions for Part 4

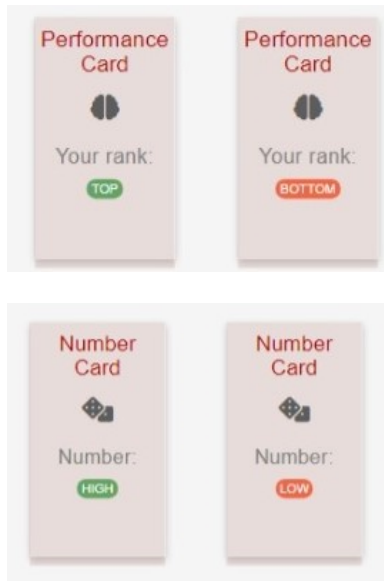
This part has 6 rounds. You will stay in the same team (Team Orange) in all rounds and the team number (high or low) always stays the same.

In each round, you will receive two "feedback cards": One performance feedback card and one number feedback card.

The performance feedback card gives you information about your relative performance on the IQ test. It shows whether you are personally in the top half (rank 1 or 2) or bottom half (rank 3 or 4) of your group. Performance cards are indicated with the brain symbol () and, depending on the feedback, can look like this:

The number feedback card gives you information about the team number. It shows whether your Team Orange got a high or low number. Number cards are indicated with the chance symbol () and, depending on the feedback, can look like this:

The information on the feedback cards is not always correct. The reliability of



the information on any card is 2/3rds. This means that the information is correct with 67% chance, and incorrect with 33% chance.

For each feedback card, the computer rolls a virtual die. The outcome remains hidden to you. If the outcome is 1, 2, 3, or 4, then the information on the feedback card is correct. If the outcome is 5 or 6, then the information on the feedback card is false.

There will be separate die rolls for each card and for each round, and there will be separate die rolls for you and your team member. Thus, it is possible that you get different feedback in different rounds. And even though the actual team number is the same for all team members, and stays the same in all rounds, it is possible that team members get different feedback about the number.

[Treatment ENDO] **Your task.** In each round, you will select exactly one of the two feedback cards to share with your team member. Your team member will also be asked which feedback card he or she wants to share with you.

[Treatment EXO] **Your task.** In each round, one of the cards will be randomly selected and shown to your team member. The performance card and number card are equally likely to be selected. You will also see a randomly selected feedback card of your team member.

After rounds 3 and 6, we will ask you again to estimate the chance that your team is the strong team.

Your payment. If this part is selected for payment, you can earn a bonus of €10. We

will pay you for one randomly selected estimate, using the same rule as described in part 2. To maximize the chance to earn a bonus, it is in your own best interest to tell us what you truly believe.

After this part, there will be two more parts.

In Part 5, you will again be asked to make two investment decisions. You will again have the option to invest in the Team Performance bet and the Number bet. Only one of the bets counts for payment if that part is selected for payment. With 80 percent chance it is the performance bet and with 20 percent chance it is the number bet. The actual amount invested will be the average investment chosen by you and your team member.

In the final part (Part 6), we will rank all 4 participants of this session in terms of their performance on the IQ test, from 1 (best performance) to 4 (worst performance). We will ask you to guess the rank of your team member. You can earn a small bonus if your guess is accurate. Your team member will be asked the same. **At the end of the experiment, you will find out how high your team member ranked you.**

For a summary of the instructions, [click here](#).

On the next page, there will be some quiz questions to test your understanding of the instructions. If you answer them correctly on your first attempt, you will earn an additional bonus of €1.

Quiz questions were: 1) How reliable is each feedback card? (The information is completely random/The information is 100% reliable (always correct)/The information is 67% reliable (correct with 67% percent chance)), 2) In the last part we will ask you to guess the overall rank of your team member. Will you find out how high your team member ranked you? (Yes/No), 3) Regarding the team number, which statement is true? (The team number is a new random draw in each round/The team number stays fixed for all rounds).

Instructions for Part 5

In this part, there will again be two investment opportunities. The investments are bets that will either pay 2.5 times the amount invested (minus the investment) or nothing.

Bet 1: The Team Performance bet. This bet pays 2.5 times the amount invested if Team Orange is the strong team. You will lose the investment if Team Orange

is the weak team.

Bet 2: The Number bet. This bet pays 2.5 times the amount invested **if the number is high**. You will lose your investment if the number is low.

The two bets are unrelated to each other. Only the team performance bet will depend on your performance on the IQ test.

Your task You will receive a separate budget of 600 cents for each of the bets. For each bet, we ask you to indicate how much of the endowment you want to invest in that bet. You get to keep the amount that is not invested.

Your payment If this part is selected for payment, one of the bets will be implemented. With 80 percent chance the Team Performance bet will be implemented, and with 20 percent chance the Number bet will be implemented.

The actual amount invested will be based on the average investment chosen by you and your team member.

Instructions for Part 6

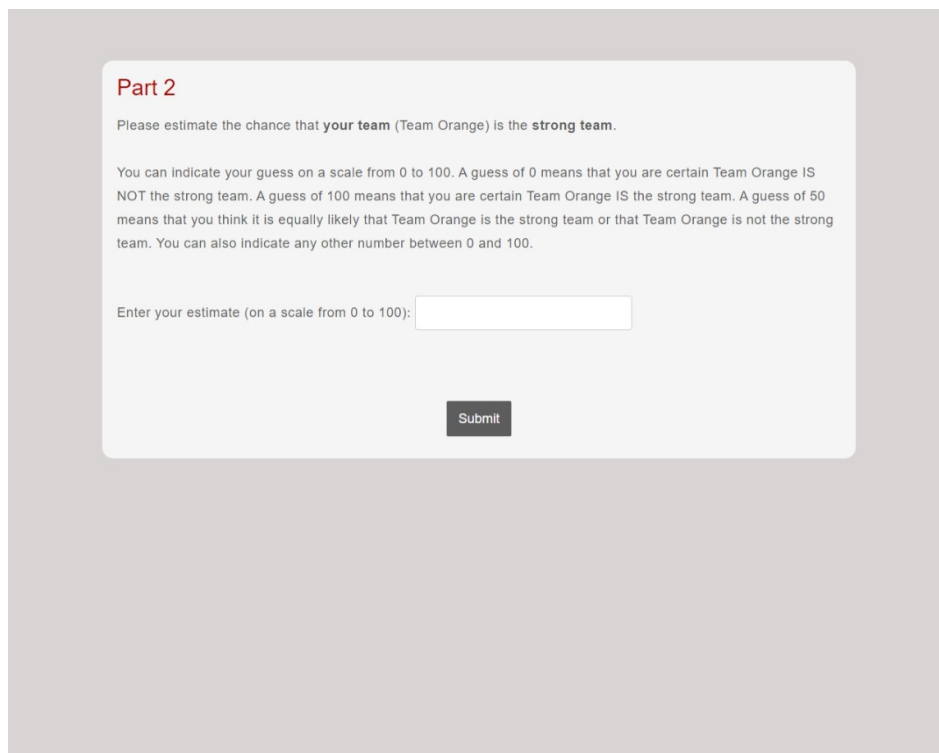
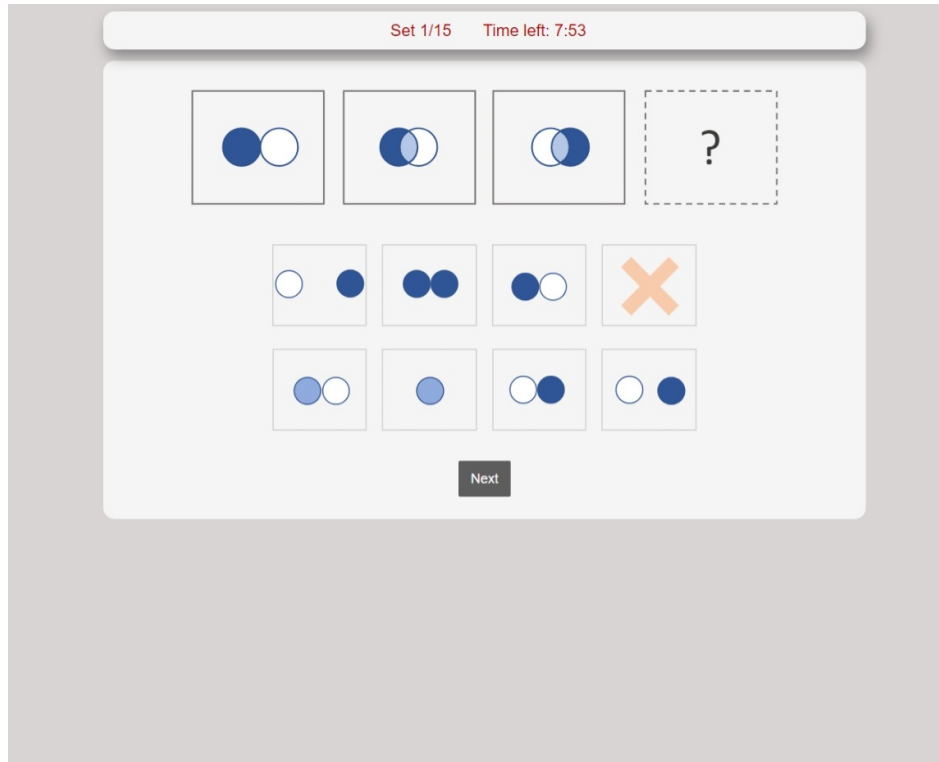
This is the final part. In this part, we will ask you to rank your team member among the entire group of participants of this session.

There are 4 participants. The participant who gave the most correct answers on the IQ test will get rank 1. The participant who gave the fewest correct answers on the IQ test will get rank 4.

If this part is selected for payment, you will receive an additional amount of €7 on top of the show up fee, and a bonus of €3 if your guess about your team member's rank is correct.

B Screenshots

These are screenshots of some of the main experimental pages (treatment ENDO).



Performance bet

How much of your endowment of 600 cents do you want to invest in a bet that pays 2.5 times the investment if your team (**Team Orange**) is the strong team?

Investment (between 0 to 600):


Submit

Part 4 Round 1

Feedback

Below are the two feedback cards for this round. The performance card reports whether you are in the top or bottom half. The number card reports whether your team has a high or low number. Each card has a reliability of 67 percent.


Please indicate which feedback card you want to share with your team member:

<p>Performance Card</p> <p></p> <p>Rank:</p> <p>BOTTOM</p> <p>Reliability: 67 %</p> <p>Share</p>	<p>Number Card</p> <p></p> <p>Number:</p> <p>LOW</p> <p>Reliability: 67 %</p> <p>Share</p>
---	---

Submit choice

Your team member received two feedback cards, and shared the following feedback card with you:

Performance card



Rank:
TOP

Reliability: 67 %

Next >

C Tables

Table C1: Background characteristics of participants

	EXO4	ENDO4	EXO8	ENDO8	<i>p-value</i>
Mean age (years)	21.7	21.1	21.1	21.5	.514
Female (%)	56	46	60	48	.236
Risk attitude (% invested) ^a	47	46	44	52	.396
Number of observations	52	48	96	96	

Notes: ^a) Risk attitude is measured as the percentage of endowment invested in the initial neutral bet. The reported *p-values* are from Kruskal-Wallis tests of equality of distributions. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Table C2: Sharing Decision in Treatment ENDO

	(1)	(2)	(3)	(4)
DV: Shares performance signal				
Performance signal TOP	0.283*** (0.030)	0.291*** (0.035)	0.290*** (0.036)	0.297*** (0.044)
Neutral signal HIGH	0.006 (0.041)	0.004 (0.042)	0.008 (0.041)	0.008 (0.041)
Score		-0.007 (0.011)	-0.009 (0.010)	-0.009 (0.010)
Round			-0.022** (0.010)	-0.022** (0.010)
Female			-0.082** (0.037)	-0.075 (0.052)
Performance signal TOP X Female				-0.015 (0.081)
Age			0.000 (0.006)	0.000 (0.006)
Risk attitude ^a			-0.000 (0.000)	-0.000 (0.000)
Constant	0.393*** (0.037)	0.451*** (0.109)	0.635*** (0.158)	0.631*** (0.159)
Observations	864	864	864	864
R-squared	0.081	0.081	0.098	0.098

Notes: This table reports the estimates from a linear probability model. The dependent variable is the decision to share a performance signal. ^a) Risk attitude is measured by the initial investment in the neutral bet. Robust standard errors are in parentheses, clustered at the matching group level. *** p<0.01, ** p<0.05, * p<0.1.

Table C3: Team Confidence and Team Size

DV: Belief to be in a strong team	(1) Final beliefs	(2) Δ belief
Treatment ENDO (a)	7.232 (5.955)	7.822 (5.701)
Large team	-3.122 (6.465)	2.937 (6.224)
ENDO x Large team (b)	4.799 (7.791)	2.886 (7.726)
Constant	56.038*** (5.119)	-13.635*** (4.474)
p -value (a)+(b)=0	0.021	0.046
Observations	292	292
R-squared	0.036	0.039

Notes: This table reports the estimates from a linear probability model. The dependent variable is the belief to be in the strong team (0-100), as elicited in round 6 in model (1), or the variation in beliefs over time in model (2) (Δ belief = final belief - initial belief). Robust standard errors in parentheses are clustered at the matching group level. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Table C4: Team Investments and Team Size

	(1)	(2)	(3)
DV:	Δ invest	Δ invest	Δ invest
Sample:	All	Weak teams	Strong teams
Treatment ENDO	76.832** (35.030)	101.202* (53.415)	52.462 (47.961)
Large team	17.436 (39.157)	-34.798 (48.907)	69.670 (51.324)
ENDO x Large team	-8.873 (48.722)	15.402 (69.368)	-33.149 (67.753)
Constant	-57.769** (22.114)	-63.077* (35.949)	-52.462* (29.205)
Observations	98	49	49
R-squared	0.166	0.187	0.081

Notes: OLS estimates. Dependent variable is the change in investment in the performance bet (final investment minus initial investment, averaged over all team members). Robust standard errors in parentheses are clustered at the group level (column 1) or team level (columns 2 and 3). *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Table C5: Investments and feedback

	(1)	(2)
	Investment in Performance bet	Investment in Neutral bet
# positive performance signals (own)	37.957*** (6.818)	-1.283 (6.230)
# positive performance signals (shared)	14.437*** (4.187)	1.864 (4.317)
# negative performance signals (shared)	-19.867*** (3.829)	2.409 (4.157)
# high neutral signals (own)	6.012 (6.635)	44.256*** (7.058)
# high neutral signals (shared)	5.542 (4.627)	20.315*** (4.101)
# low neutral signals (shared)	-2.391 (4.913)	-12.072*** (4.100)
Constant	202.169*** (37.128)	106.101*** (37.995)
Observations	292	292
R-squared	0.201	0.264

Notes: OLS estimates. The dependent variable is the investment in the performance bet (col 1) or neutral bet (col 2). Robust standard errors in parentheses are clustered at the matching group level. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Table C6: Gender and beliefs and investments in the performance bet

	(1)	(2)	(3)	(4)
	final beliefs		Δ investments	
Treatment ENDO	11.765*	11.689*	106.403**	108.293**
	(6.521)	(6.537)	(44.508)	(43.895)
Female	-4.160	-4.040	66.539	63.521
	(6.034)	(6.063)	(39.758)	(39.144)
Treatment ENDO x Female	-3.961	-3.975	-58.192	-57.830
	(7.635)	(7.640)	(47.385)	(46.792)
Risk attitude ^a		0.004		-0.089
		(0.009)		(0.057)
Constant	56.459***	55.424***	-85.574**	-59.646
	(5.405)	(6.099)	(39.182)	(44.136)
Observations	292	292	292	292
R-squared	0.047	0.047	0.048	0.054

Notes: OLS estimates. ^a) Risk attitude is measured by the initial investment in the neutral bet. Robust Standard errors in parentheses, clustered at the matching group level. Δ investment in column (2) is the increase in investments in the performance bet (final minus initial investment). *** p<0.01, ** p<0.05, * p<0.1