Delegation to a Group*

Sebastian Fehrler
Department of Economics
University of Konstanz
Box 131
78457 Konstanz
Germany
sebastian.fehrler@uni-konstanz.de

Moritz Janas
Department of Economics
University of Konstanz
Box 135
78457 Konstanz
Germany
moritz.janas@uni-konstanz.de

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Abstract

We study the choice of a principal to either delegate a decision to a group of careerist experts, or to consult them individually and keep the decision-making power. Our model predicts a trade-off between *information acquisition* and *information aggregation*. On the one hand, the expected benefit from being informed is larger in case the experts are consulted individually. Hence, the experts either acquire the same or a larger amount of information, depending on the cost of information, than in case of delegation. On the other hand, any acquired information is better aggregated in case of delegation, where experts can deliberate secretly. To test the model's key predictions, we run an experiment. The results from the laboratory confirm the predicted trade-off, despite some deviations from theory on the individual level.

Keywords: delegation, decision rights, committees, group decision-making, expert advice, strategic communication.

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1 Introduction

Careful management of decision rights and the flow of information is crucial for organizational success. Principals often have to choose whether to delegate a decision or to seek advice and decide by themselves. As they lack the time to become informed about every issue that lands on their table, they typically have to rely on experts to gather relevant information. Consider a manager, for example, who faces the decision whether or not to invest in the development of a new product but lacks the technical knowledge to make the decision. She could ask the engineers in her company for advice or delegate the decision to them.[1] Whether or not delegation of decision-making is a good idea depends on the effects on information acquisition and on how acquired information is used in the decision-making process. We study these effects theoretically and experimentally, focusing on delegation to a group of experts rather than to a single agent. As we will see, quite different effects are at play in this scenario, which has, so far, largely been neglected in the literature.

Delegation of decision-making by a single principal to a single expert has been studied extensively for various set-ups (e.g., Aghion and Tirole, 1997; Dessein, 2002; Prat, 2005; Fox and Van Weelden, 2012; Argenziano et al., 2016).[2] However, many decisions are delegated to groups of experts rather than to a single agent, and if a decision is not delegated, often more than one expert is consulted. Studying this set-up, we link the previous delegation literature to the literature on decision making in committees of careerist experts. Most of the papers in this literature consider the case of costless information (e.g., Levy, 2007b,a; Visser and Swank, 2007; Gersbach and Hahn, 2008; Mattozzi and Nakaguma, 2017; Fehrler and Hughes, 2018) with two exceptions (Gersbach and Hahn, 2012; Swank and Visser, 2019). None of them studies the decision to delegate a task to the committee, which is the focus of our study. We will see that the case of costly information is of particular interest as it gives rise to a trade-off between information acquisition and aggregation.

The experts in our model differ in their level of competence: that is, in the accuracy of the information they can acquire. More specifically, the level of competence determines the probability that they will be informed about the state of the world after investing the cost to acquire information. The experts' types are private information and they care about being perceived as competent – the standard assumption in many career concerns models (e.g., in Levy, 2007b,a; Visser and Swank, 2007; Gersbach and Hahn, 2008; Mattozzi and Nakaguma, 2017; Fehrler and Hughes, 2018). The principal, on the other hand, is interested in reaching the optimal decision for the organization. To arrive at a decision, the principal can consult each expert individually and then decide herself. Alternatively, she can delegate the whole decision-making process to the experts. In this case, the experts form an ad-hoc committee, discuss the information they might have acquired, and decide collectively on behalf of the principal.

Considering delegation to a group instead of to an individual expert turns the spotlight on

[1] Further examples of delegation to, or consultation of, groups of experts include monetary policy committees in central banks, parliamentary and party committees in politics, team councils in sports, and hiring committees in academia.

[2] In some of these set-ups, conflicts of interests arise from different preferences regarding the decision (e.g., Aghion and Tirole, 1997; Dessein, 2002; Argenziano et al., 2016) in others, conflicts of interest arise from career concerns (e.g., Prat, 2005; Fox and Van Weelden, 2012).

two aspects that become crucial in this context. On the one hand, careerist experts can aggregate information better among themselves because incompetent members can admit their lack of information to other group members, whereas they cannot admit this to the principal as it would reveal their incompetence.[3] As a consequence, the principal is better off delegating the decision if agents can acquire information at no cost. On the other hand, it is less beneficial for an expert to acquire information in case of delegation of decision-making to the group, as opposed to the case of consulting the experts individually, because the accuracy of the group decision has a smaller effect on the principal's assessment of their competence. Moreover, if other experts also bought information, this could make any expert's own acquired information redundant. As a result, the incentive for information acquisition is stronger when one is approached by the principal individually compared to when one is part of a group that takes a decision. Hence, if information is costly (but not excessively costly), there is a trade-off between the effect of delegation on information aggregation (positive) and on information acquisition (negative). Which of the two effects dominates, and hence whether the decision should be delegated or not, depends on the level of the costs of information.

These predictions depend on a number of assumptions regarding the equilibria that will be played – the results sketched above hold if the most-informative equilibrium is played – and the degree of strategic behavior by the agents. It is, therefore, not obvious that the model will predict behavior accurately. Moreover, recent experimental studies have shown that principals are very reluctant to delegate decisions even when it is beneficial to do so (e.g., Fehr et al., 2013; Bartling et al., 2014). To investigate the predictive power of our theoretical model, we conduct a laboratory experiment in which the costs of information are varied between three treatments. In each treatment, subjects play a number of rounds under either regime (consulting all experts individually or delegation of decision-making to the group of experts). These two parts are followed by a final part, in which the principal can decide whether to delegate the decision or not. This allows us to study whether principals delegate whenever our model says they would.

Our experimental results confirm that information is better aggregated under delegation. As predicted, communication of uninformed experts is more honest than in case experts are consulted individually. It is also the case that under delegation less information is acquired than if the experts are consulted individually in our high-cost treatment. However, this difference is much smaller than predicted. As a consequence, the positive effect through improved aggregation still outweighs the negative effect of fewer information acquisitions. Despite the fact that delegation leads to more correct decisions in all our treatments, more than 60% of the principals in each of the treatments choose to consult the experts individually instead. A potential explanation is that they value being in charge *per se*, as suggested by Bartling et al. (2014) as the main reason for the reluctance to delegate in their experiment. Consistent with this hypothesis, the share of choices to consult individually shrinks in another, subsequently developed treatment, in which the role of the committee is reduced to that of an advisory board and the decision right stays with the principal

[3]This effect is similar to the effect of secret decision making as compared to transparency in committees of careerist experts (see Fehrler and Hughes, 2018).

in both regimes. However, even in this modified setting, a majority of principals prefer to consult the experts individually. Hence, a non-instrumental value that they might attach to the decision right cannot fully explain the low number of delegation decisions in our main treatments. To shed more light on this puzzling behavior, we analyze our subjects' answers to open questions about their behavior in the post-experimental questionnaire. These answers reveal a variety of reasons – simple curiosity in the individual experts' messages being one of them.

We review the related literature in the next section. We set up the model and derive theoretical results in Section 3. In Sections 4 and 5, we describe our experimental design, state our hypotheses and present our experimental results, before discussing them and concluding in Section 6.

2 Related Literature

Delegation The delegation literature, which focuses on set-ups with a single principal and a single agent, starts with Holmström (1984) and has received a lot of attention since the seminal work of Aghion and Tirole (1997). They stress the trade-off between saving the costs of information acquisition and the loss of control of the principal whose agent has different preferences regarding the final decision. Dessein (2002) also considers an environment with different preferences but without costly information acquisition where the principal can choose between communication and delegation. The trade-off that arises in his set-up is between a loss of control by choosing delegation, and a loss of information by choosing communication. Similar set-ups are studied in Lai and Lim (2012) and with costly information acquisition in Argenziano et al. (2016). The aforementioned papers with conflicts of interest between the principal and the agent find, among other things, that whether to delegate or not depends on the size of the conflict of interest between principal and agent. The studies with costly information find that delegation increases the effort that agents invest in acquiring information. In line with this latter finding, Liberti (2018) present evidence from an empirical investigation of the effects of delegation, which shows that delegation leads to more effort provision of loan-officers in a banking environment. Note that our predicted effect of delegation on information acquisition goes in the opposite direction. We predict fewer information acquisitions under delegation to a group because of the free-riding incentive that arises.

Prat (2005) and Fox and Van Weelden (2012) study the optimal level of transparency between a principal and an agent in a delegation set-up. The misalignment of incentives for the agent and the preferences of the principal in their models stems from career-concerns (Holmström, 1999). The agent is not (only) interested in the decision outcome *per se*, but cares about signaling his ability level. Hence, it matters what part of the decision process the principal can observe, which also plays a key role in our set-up.

Fehr et al. (2013) study Aghion and Tirole's (1997) set-up experimentally and find a suboptimal level of delegation by the principals – a finding that spurred a string of further investigations and explanations for under-delegation. Bartling et al. (2014) argue that the reason for suboptimal delegation is an intrinsic utility from having the decision power. Neri and Rommeswinkel (2017) suggest that it is not only utility derived from power, but the disutility of letting others interfere in a decision that leads to a suboptimal level of delegation. Danz et al. (2015) explain suboptimal delegation by reference to hindsight bias of principals, which makes them overconfident with respect to their ability to decide correctly by themselves. Taking these considerations into account, we design an additional treatment in which the decision right stays with the principal also in the alternative case to consulting the experts individually.

Committee Decision-Making Committee decision-making with costly information acquisition but without career concerns is studied theoretically in Gersbach (1995), Persico (2004) and Gersbach and Hahn (2012). In the set-ups of these studies, the committee members face a public goods problem, as they have an incentive to free-ride on the information acquisition of others, as is the case in our model under delegation. Even earlier contributions to the literature are the committee-legislature models by Gilligan and Krehbiel (1987, 1989). They focus on the effects of different amendment rules of the legislature on information acquisition of a single player representing a parliamentary committee (in the 1987 paper), and on the bill that the parliamentary committee proposes to the legislature (in both papers). Career concerns in committee decision-making with costless information is studied in a string of recent theoretical models (Visser and Swank, 2007; Levy, 2007b,a; Gersbach and Hahn, 2008; Mattozzi and Nakaguma, 2017; Fehrler and Hughes, 2018), some of which focus on the effect of transparency. Transparency is also studied by Gradwohl (2018), where committee members are not career concerned but have a preference for strategic ambiguity, and in Gradwohl and Feddersen (2018) and Feddersen and Gradwohl (2019), where the committee takes the role of an advisory board and the focus lies on communication between the committee members and a principal who does not share their preferences. Unlike the above-mentioned papers, in which information is costless, Gersbach and Hahn (2012) and Swank and Visser (2019) study information acquisition in committees of careerist experts – the former focusing on the role of transparency, the latter on the interplay of external and internal reputation concerns (that is, reputation concerns toward other committee members). Using data from the Federal Open Market Committee, Meade and Stasavage (2008) and Hansen et al. (2018) study empirically how a change in this monetary policy board's transparency rules affected the way committee members deliberate.

Common-value committees with costly information acquisition are also studied experimentally by Elbittar et al. (2016), Großer and Seebauer (2016), Großer and Seebauer (2017) and Bhattacharya et al. (2017). Experiments with career-concerned experts in committees have mainly focused on the level of transparency of the decision-making process (Mattozzi and Nakaguma, 2017; Fehrler and Hughes, 2018; Renes and Visser, 2019).

What is common to most of these papers is that what other players observe about the committee members' behavior matters to them and hence affects their choices in the information acquisition, deliberation or voting stages of the different models, experiments or monetary policy decision-making processes. This is also the case in our set-up.

As we will formally derive next, delegation to a group (or committee) gives rise to a trade-off between information acquisition and information aggregation, and the optimal choice of the principal will crucially depend on how costly information is.

3 The Model

3.1 Set-Up

An uninformed principal (she) wants a binary decision $D \in \{A, B\}$ that matches the state of the world $S \in \{A, B\}$ to be implemented. In case of success ($D = S$) she receives a payoff of 1 and 0 otherwise. Both states of the world are equally likely and the realization of S is *a priori* unknown. The principal herself cannot obtain any signal about the state of the world but there are $n \in \mathbb{N}$ experts, indexed by $j \in [1, ..., n]$, who can. Obtaining a signal $s_j \in \{A, B, \emptyset\}$ comes at cost $C \in [0, \infty)$. The experts can be of two different competence types $t_j \in \{i, c\}$.[4] Their type determines the probability of being informed about the state of the world after obtaining a signal. While a competent expert k ($t_k = c$) will always receive a perfectly informative signal ($s_k = S$) if he chooses to pay the information cost C, an incompetent expert l ($t_l = i$) will receive a perfectly informative signal ($s_l = S$) with probability $p \in (0, 1)$ and an uninformative signal ($s_l = \emptyset$) with probability $(1 - p)$.[5]

The experts are driven by career concerns and their utility does not depend on the decision about the project D *per se*. Instead, they only care about being perceived as competent in the eyes of the principal. As is standard in career concern models, their utility equals the posterior probability that the principal attaches to them being competent at the end of their interaction. The prior probability of an expert being competent is publicly known to be λ, and their type, their acquiring decision, as well as their acquired signal (if one is acquired) are private information of each expert.

The principal has two options: Consulting the Experts Individually (CI) and Delegating the Decision to the Group (DG). The experts learn the principal's choice before deciding whether or not to acquire a signal at cost C. Under CI, after possibly acquiring a signal and observing it, each expert j submits a costless message $M_j \in \{A, B, \emptyset\}$ to the principal, who then makes the decision D. The messages are sent simultaneously. After the decision is implemented, the true state of the world S is revealed and the principal uses all available information to update her belief about the type of each expert using Bayes' rule.

The other option, DG, shifts the decision power to the experts. Under DG, as under CI, after knowing which option the principal chose, each expert can first decide on whether or not to acquire a costly signal. Then the experts form a committee, simultaneously submit a costless message

[4]Throughout the paper we refer to the difference in competence when talking of a *type*.

[5]Competence can, thus, be interpreted as knowing where to look for information. While a competent expert knows where he can find the answer to his question, an incompetent experts looks at the wrong place with positive probability and might thus stay uninformed despite investing the (effort) cost of looking for information.

$M_j \in \{A, B, \emptyset\}$ to all other experts, and afterwards decide on D via majority rule.[6] In case of a tie, the committee decision is made by a coin flip.[7] Neither the messages nor the votes (and potentially the coin flip) within the committee are observed by the principal. After learning the true state of the world, the principal updates her beliefs about the experts' types, as under CI, but this time she has to rely on less information. While the message of each expert can be used for updating under CI, only the decision of the whole committee can be used under DG.

3.2 Timeline

The detailed timeline looks as follows:

Stage 0

Nature determines the state of the world $S \in \{A, B\}$ and draws types. Each expert j privately learns his type $t_j \in \{i, c\}$.

Stage 1

The principal decides whether to consult individually or to delegate the decision. The experts observe her choice.

Stage 2

Each expert decides whether or not to acquire a signal s_j at cost C. Those who acquire a signal observe it privately.

Stage 3

CI Each expert sends a message $M_j \in \{A, B, \emptyset\}$ to the principal.

DG Each expert sends a message $M_j \in \{A, B, \emptyset\}$ to the other expert(s).

Stage 4

CI The principal observes messages and decides on $D \in \{A, B\}$.

DG The experts observe messages and decide on $D \in \{A, B\}$ by voting under majority rule. Ties are resolved by the flip of a fair coin.

Stage 5

CI The true state of the world $S \in \{A, B\}$ is revealed and the principal updates her belief about each expert based on the message and the true state. Each expert j's utility realizes as $U_j = Pr(t_j = c|S, M_j)$. The principal's utility realizes as $U_P = 1$ if $S = D$ and $U_P = 0$ if $S \neq D$.

[6] With $n < 3$, as in the experiment, the majority rule equals a unanimity rule.

[7] Alternatively, we could assume that committee members can coordinate their votes via a public randomization device to avoid a tie, which would reveal their disagreement.

DG The principal learns the decision of the committee, and the true state of the world $S \in \{A, B\}$ is revealed. She updates her belief about each expert's type based on the group decision and the true state. Each expert j's utility realizes as $U_j = Pr(t_j = c|S, D)$. The principal's utility realizes as $U_P = 1$ if $S = D$ and $U_P = 0$ if $S \neq D$.

3.3 Equilibrium Predictions

The solution concept we use is Perfect Bayesian Equilibrium (PBE). We focus on type-symmetric PBEs and ignore equilibria with inverted language. Even with these restrictions there are multiple equilibria, which is typically the case in cheap talk games. To derive precise testable predictions, we restrict the set of equilibria further by focusing on the most-informative equilibria: that is, the equilibria in which the final decision is based on the greatest amount of information possible. This allows us to ignore unintuitive babbling equilibria and equilibria in which nobody is ever pivotal in the voting stage under delegation.[8,9]

With these restrictions, the principal's posterior belief about the experts' competence increases in the case of a correct decision (a correct individual advice) under DG (CI) unless the cost of information is too high to allow for information acquisition at least of the competent experts. Under CI, informed experts will, therefore, truthfully communicate their signal, while uninformed experts will try to conceal their ignorance by communicating A or B randomly with equal probability. Truthfully communicating $\emptyset$ would reveal their incompetence.[10]

In the deliberation stage under DG, the experts are in a common-value situation. Our equilibrium prediction is that they will share any information among themselves truthfully and decide unanimously on the decision that is more likely to match the true state of the world (as in Coughlan, 2000; Guarnaschelli et al., 2000; Goeree and Yariv, 2011). In case both states of the world appear equally likely to them (which can only occur in case no expert is informed), they collectively decide on A or B with equal probability (as in Fehrler and Hughes, 2018).[11]

Depending on the magnitude of the costs C, equilibrium decisions in the two regimes differ in their accuracy. Proposition 1 summarizes our main results in this respect. In Appendix A, we characterize the equilibria of both regimes for the whole range of C.[12]

[8] Focusing on type-symmetric equilibria is common practice in the voting literature (e.g., Palfrey and Rosenthal, 1985; Feddersen and Pesendorfer, 1998; Levy, 2007b) and seems natural, as players of the same type are identical and it would be very difficult to coordinate on an equilibrium in which they play different strategies.

[9] The theoretical cheap-talk literature has focused mainly on the most-informative equilibrium with various justifications (e.g., Crawford and Sobel, 1982; Ottaviani and Sørensen, 2001; Chen et al., 2008) and experimental evidence indicates that subjects indeed tend to acquire (e.g., Elbittar et al., 2016; Bhattacharya et al., 2017; Großer and Seebauer, 2016, 2017) and share (e.g., Guarnaschelli et al., 2000; Cai and Wang, 2006; Goeree and Yariv, 2011; Fehrler and Hughes, 2018) a lot of information in information acquisition and cheap talk games.

[10] This behavior is supported as an equilibrium action by the principal's out-of-equilibrium belief that the message $\emptyset$ could only stem from an incompetent expert. This could be micro-founded by a tremble of the experts between truth-telling and strategic communication in the messaging stage.

[11] The 50-50 mixing stems from the fact that any other mixing probability would lead to a lower expected posterior belief of the principal following the decision that is chosen with higher probability. Hence, any expert (with positive probability of being pivotal) could benefit from deviating by voting for the other option. Only when either group decision is made with equal probability no such profitable deviation exists.

[12] Note that our main theoretical result, Proposition 1, also holds for another set of equilibria: type-symmetric

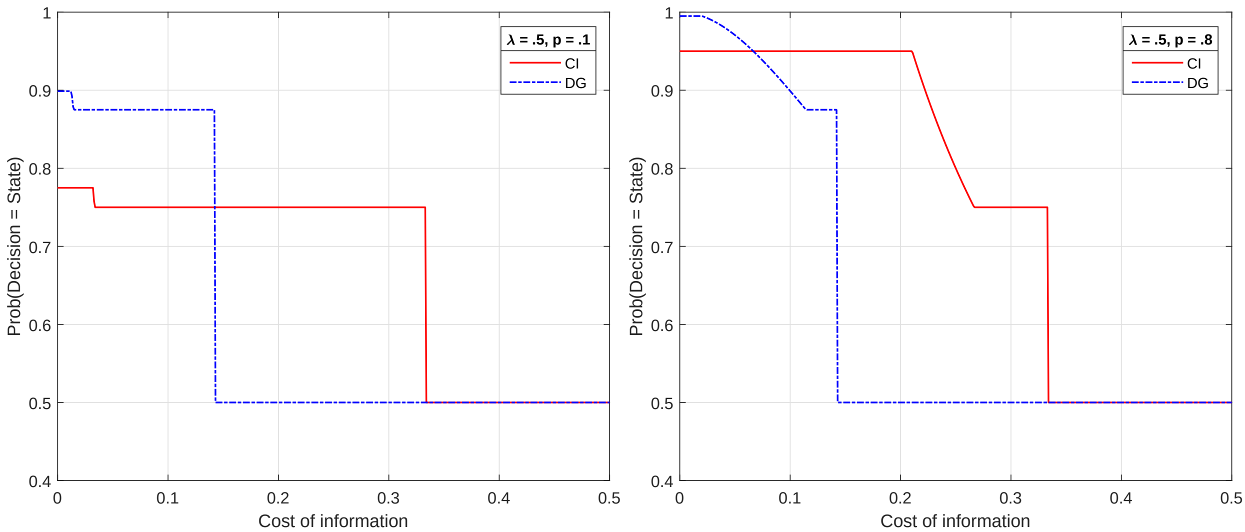
Proposition 1

For all numbers of experts $n \geq 2$, all prior probabilities of competence $\lambda \in (0,1)$ and all levels of incompetence $p \in (0,1)$, there always exist cost levels $C'(n,\lambda,p) < C''(n,\lambda,p) < C'''(n,\lambda,p)$, such that

1. *delegation to the group of experts leads to a higher decision accuracy than consulting the experts individually if $0 \leq C \leq C'$,*
2. *consulting the experts individually leads to a higher decision accuracy than delegation to the group of experts if $C'' < C \leq C'''$,*
3. *and both regimes lead to the same decision accuracy if $C''' < C$.*

Proof. See Appendix A. □

To illustrate, Figure 1 plots the different decision accuracies for a committee of two experts under CI and DG for $\lambda = 0.5$ and different cost levels. Panel (a) plots the success probability for $p = 0.1$, indicating that incompetent experts who acquire information receive an informative signal with probability 0.1, while panel (b) shows the plot for a lower discrepancy between competence levels of the two types with $p = 0.8$. For both parameter settings, the graph shows that for low (medium) costs of information DG (CI) outperforms CI (DG). For high costs, the only sustainable equilibrium is when no information is acquired and all decisions are made without any information.



(a) $p = 0.1$, high difference in competence

(b) $p = 0.8$, low difference in competence

Figure 1: Decision Accuracies of the Most-Informative Equilibrium for $n = 2$ Experts.

PBEs, in which incompetent experts never acquire information and competent experts do so with a probability that is smaller than one for most of the cost range (the exceptions are the cost values that coincide with the thresholds in Proposition 1). In the most-informative equilibria, competent experts acquire information with probability one if information acquisition is not prohibitively expensive, and incompetent experts with probability ≥ 0. Hence, in the other set of equilibria less information is acquired than in the most-informative equilibria. We characterize these equilibria in Appendix A3.

The intuition underlying these results rests on a trade-off of information acquisition and information aggregation.

Why Delegation Improves Information Aggregation The dominance of DG in the low range of C stems from superior information aggregation and the fact that similar amounts of information are acquired under both regimes. The main difference compared to CI is that the experts can truthfully reveal to the other experts if they are uninformed under DG. Under CI, on the contrary, it would never be optimal to reveal ignorance about the state of the world if the principal believed that competent experts acquire a signal. Hence, uninformed experts are predicted to strategically pretend that they have received an informative signal, and doing so, they will sometimes contradict the correct messages of other, informed, experts. This can lead to wrong decisions being made by the principal. Under DG, this cannot happen as the committee would always implement the correct decision if at least one expert knew the true state of the world.

Why Consulting the Experts Individually Increases the Incentive to Acquire Information Under CI, the principal updates her beliefs about the competence of an expert based on the true state and the message she received from the expert. Hence, an expert's incentive to acquire information is independent of the other experts' behavior. Under DG, however, the whole committee benefits from the information acquired by any expert. Moreover, after the acquisition stage, the preferences for every expert in the committee are aligned and any information will be truthfully shared. Thus, information acquisition has the typical structure of a public goods game and the incentive to pay C in order to receive a signal becomes weaker with a higher number of experts in the committee. As a consequence, the threshold cost level above which it is no longer beneficial for an expert to acquire information in order to increase the chance of a correct message (CI) or decision (DG) is lower for DG than for CI. Hence, there is always a range of costs where no information is acquired under DG, but competent experts still acquire information under CI. In this cost range, the success probability is lower under DG than under CI.

4 Experimental Design and Hypotheses

4.1 Design

For all treatments, we set $\lambda = 0.5$ and $p = 0.1$. Our main treatment variable is the cost of information, which takes values of 0, 10, and 30 in the three different main treatments and 0 in the subsequently developed additional treatment. The experiment consists of 23 rounds. For rounds 1-20, the regime under which subjects play is exogenously given. Half the sessions start with 10 rounds of CI (DG), followed by 10 rounds of DG (CI). For the remaining three rounds, principals can choose whether to play DG or CI. Table 1 gives an overview of the treatments, number of subjects and number of matching groups. Figure 1 (a) displays the theoretical predictions regarding the decision accuracy for DG and CI (the costs of 0, 10 and 30 in the experiment correspond to 0, 0.1, and 0.3 in Figure 1 (a)).

Table 1: Overview of Treatments, Sessions and Matching Groups (MG)

Subjects (Sessions, MG)	Costs 0	10	30	Order CI - DG	DG - CI	Decision power under DG
36 (2,4)	✓			✓		Experts
36 (2,4)	✓				✓	Experts
36 (2,4)	✓			✓		Principal
36 (2,4)	✓				✓	Principal
36 (2,4)		✓		✓		Experts
36 (2,4)		✓			✓	Experts
36 (3,4)			✓	✓		Experts
36 (2,4)			✓		✓	Experts
18 (1,1)			✓	✓		Experts
18 (1,1)			✓		✓	Experts

For the $C = 0$ treatment, theory predicts DG will outperform CI, and our theory consequently predicts that principals will delegate. However, in case they derive utility from keeping the decision right this latter prediction might not hold. To address this issue we designed the additional treatment, also with $C = 0$, in which the principal stays in charge even when experts form a committee. The DG option is replaced. There is still a committee and the acquisition, deliberation and voting procedures are unchanged, but the committee only votes on a recommendation that the principal is free to follow or not. Hence, the committee's role is reduced to that of an advisory board. The equilibrium predictions regarding experts' behavior are unaffected by this mere shift of the decision right and the principal is always better off if she follows the committee's recommendation.

For the $C = 10$ treatment, theory predicts competent experts will acquire information and incompetent experts will refrain from information acquisition. As the amount of information that is bought is the same for both regimes, DG is again predicted to outperform CI due to improved information aggregation.

For the $C = 30$ treatment, the information acquisition predictions differ between the regimes. Under DG, our theoretical prediction is that no information will be acquired, while competent experts will still acquire information under CI. Consequently, CI is now predicted to outperform DG.

Before the first round, each subject is randomly assigned the role of principal or expert and keeps this role for the entire session.[13] At the beginning of each round, groups of three, including one principal and two experts, are randomly formed out of matching groups of nine subjects.[14] In round 11, an exogenous regime change from CI to DG (or vice versa) takes place. In the beginning

[13]See Appendix C for screen-shots of the decision-screens and the Supplementary Material for the instructions.

[14]Following the advice of two referees, who suggested further robustness checks, we later ran two additional sessions with $C = 30$. In these sessions we had larger matching groups of 18 subjects to check if our results are robust to changes in the size of a matching group. We also elicited (unincentivized) beliefs from the principals about the experts' information acquisition in Rounds 5, 15 and 22 (that is, in the middle of each part). All other design elements were kept unchanged.

of round 21, principals can decide the regime that is played within their group for the last three rounds.

The state of the world is represented as a colored jar (blue or red). The competent experts can choose to pay C to receive a ball that has the same color as the jar (a perfectly informative signal). Incompetent experts, who chose to pay C, receive a gray ball with probability $\frac{9}{10}$, which leaves them ignorant about the state of the world. With probability $\frac{1}{10}$ they receive a ball that has the same color as the jar. If an expert chooses not to pay, he does not get to see any ball.

In the next stage, an expert can choose to send one of three pre-specified messages: 'I recommend red'/'I recommend blue'/'I do not have any information'. The recipient of these messages is either the principal of their own group (under CI) or the other expert in their group (under DG). In the CI rounds, the principal can then, after observing the messages of both experts of her group, choose which decision to implement. In the DG rounds, each expert votes for either blue or red after receiving the message of the other expert in the group, and the decision is implemented using majority rule. In the case of a tie, one decision is randomly implemented with equal probabilities and the principal is not informed about the tie. In the additional treatment where the principal keeps the decision right, the experts do not vote on the decision itself but on a group-recommendation to the principal who then implements the decision herself.

After the decision is implemented, a principal of a different group (but from the same matching group), whom we call the observer, sees the true state of the world as well as the messages (CI) or the group decision (DG) and has to enter a probability in per cent $x_j \in [0, 100]$ for every expert $j \in \{1, 2\}$, which refers to how probable she thinks it is that this expert is competent. This evaluation determines the payoff of expert j as x_j, and the observers themselves are incentivized to report their true belief with a quadratic scoring rule.[15] We cannot let the principals do the evaluation of the experts in their own group as they would then (in round 21) have another reason to choose CI, where they learn more about the experts, in order to get a higher payoff from more accurate evaluations. This would be at odds with the model.

Additionally, the payoff of the decision is 50 points for the principal if it is correct, and 0 points otherwise. After every round, each expert receives feedback about the true state, the decision, and their own payoff from the evaluation of the observer. The principal receives feedback about whether or not the correct decision is implemented, and the competence levels of the observed subjects. The competence level and the signal acquisition decision of an expert is neither revealed to the principal of the own group, nor to the other expert. At the end of the experiment, three of the first 10 rounds, three of rounds 11–20, and one of rounds 21–23 are randomly selected as payoff-relevant. To avoid hedging incentives for the principals, only one randomly determined evaluation of an expert within a selected round is payoff relevant but never two evaluations from the same round. Each point is converted into 2.5 Euro Cents.

Printouts of the instructions for the first 10 rounds are distributed at the beginning of the experiment. The instructions for each following part are distributed after the end of the preceding part.

[15] If the evaluated expert j is competent, the observer's payoff is $\Pi_c = \frac{1}{2} \cdot (100 - \frac{1}{100} \cdot x_j^2)$, while it is $\Pi_i = \frac{1}{2} \cdot (100 - \frac{1}{100} \cdot (100 - x_j)^2)$ in case the expert is incompetent.

Before the experiment starts, the subjects answer an unincentivized quiz on their screens.[16] The experiment was conducted in 2017 and 2018 (and the two additional sessions with larger matching groups in 2019) in the LakeLab of University of Konstanz using z-tree (Fischbacher, 2007) for the treatment and ORSEE (Greiner, 2015) as well as hroot (Bock et al., 2014) for the recruitment of the subjects. The average earnings in the 19 sessions with 324 participants (average age: 22.49 years, female: 59%) were 17.41 Euro (sd = 2.20) including a show-up fee of 3 Euro. Each session lasted around 80 minutes, including a post-experimental questionnaire and the payment.[17]

4.2 Hypotheses

Our experimental design allows us to test the following hypotheses, which arise from the solution of the model (Hypothesis 1 - 3), and from the addition of a potential intrinsic value of keeping the decision right (Hypothesis 4).

Hypothesis 1 (Information Acquisition) The share of competent experts that acquire information in the high cost ($C = 30$) treatment is higher under CI than under DG, while it is the same in all other treatments.[18]

Hypothesis 2 (Information Aggregation) The share of messages honestly revealing a lack of information is higher under DG than under CI in all treatments.[19]

Hypothesis 3 (Decision Accuracy) DG outperforms CI in the $C = 0$ and $C = 10$ treatments, but not in the $C = 30$ treatment.[20]

Hypothesis 4 (Delegation) CI is chosen less often when delegation leads to a higher decision accuracy (that is, in the $C = 0$ and $C = 10$ treatments as compared to the $C = 30$ treatment), and, comparing the two $C = 0$ treatments, CI is chosen less often in the additional treatment where the decision power stays with the principal.

As there are multiple equilibria under both regimes, it is *a priori* unclear whether the predicted most-informative equilibrium will be played. Moreover, the predicted behavior of the experts involves some depth of strategic reasoning, and it is unclear whether these predictions are accurate descriptions of actual behavior. Under CI, we predict incompetent experts to lie about their competence by recommending a decision even if they did not acquire a signal or if they received an

[16] See Supplementary Material for the quiz.

[17] The unincentivized post-experimental questionnaire included questions on sociodemographic characteristics and open questions about the reasons underlying the behavior in the experiment. Table B1 gives an overview of further descriptive subject characteristics for each treatment.

[18] In the high-cost treatment, the cost of information lies between C'' and C''', which is the cost range where competent experts acquire information only under IC. The cost levels of the other two treatments lie below C'', which is the cost range where competent experts acquire information under IC and DG.

[19] This stems from the fact that revealing a lack of information to the principal lowers her belief about the expert's competence, while revealing it in the committee increases the chance of a correct committee decision and, thus, also increases the (expected) principal's evaluation.

[20] See Figure 1 (a).

uninformative one (Hypothesis 2). In DG with high costs, our model predicts no acquisitions because the positive externalities of information (information being a public good in the committee) are not internalized (Hypothesis 1). This is at odds with findings of over-acquisition of signals in recent experimental studies on information acquisition in committees (Großer and Seebauer, 2016, 2017; Bhattacharya et al., 2017). It can also not be taken for granted that the belief-updating of principals will be well approximated by Bayesian updating. Finally, while previous studies (e.g., Fehr et al., 2013; Bartling et al., 2014) found clear evidence for under-delegation, whether or not an intrinsic utility derived from keeping the decision right is the driving force behind this phenomenon is less clear. Hence, none of our hypotheses is obvious to hold in the laboratory.

5 Experimental Results

We present our experimental findings in the following order: (i) results regarding the experts' behavior with respect to information acquisition and communication, (ii) results regarding the decision accuracies, (iii) results regarding the principals' choice between CI and DG, (iv) results regarding the observers' evaluation behavior, and (v) results regarding changes in behavior over time and potential reasons for deviations from our predictions.[21]

We test for treatment differences with tests based on clustered standard-errors at the matching-group level. For comparisons within treatments, we also take the paired structure of the data into account, which stems from the fact that all subjects play under both regimes. For this purpose, we run regressions with subject fixed-effects. Furthermore, due to the limited number of matching groups (and hence potentially rather imprecisely estimated standard errors; see, e.g., Cameron and Miller, 2015), we also report the results of non-parametric Wilcoxon signed-rank tests.

5.1 Experts' Behavior

Experimental Result 1 (Information Acquisition): *Hypothesis 1 is confirmed. However, in the $C = 30$ treatment, we observe over-acquisition by competent experts compared to theory. Apart from that, information acquisitions are well predicted.*

Table 2 shows the relative frequencies of signal acquisitions of experts in the laboratory, as well as the theoretically predicted frequencies. The double entries in the $C = 0$ treatment of DG are for the share of information acquisition in case the group has the decision power (first entry), and in case the principal keeps the decision power under DG (second entry). The acquisition behavior matches the prediction well in most cases. The competent experts in the $C = 30$ treatment are the exception with 60% information acquisition under DG and 70% under CI, where theory predicts 0% and 100%, respectively.

[21] We do not include the data stemming from the two sessions with larger matching groups in (i) - (iv), but only use them for the robustness checks in Section 5.5.

Table 2: Relative Frequencies of Information Acquisitions

	CI				DG			
	incompetent		competent		incompetent		competent	
	Actual	Pred.	Actual	Pred.	Actual	Pred.	Actual	Pred.
C = 0	92 %	(100)	100 %	(100)	89 %, 89 %	(100)	100 %, 100 %	(100)
C = 10	17 % **	(0)	91 %	(100)	7 % **	(0)	89 %	(100)
C = 30	3 %	(0)	70 % **	(100)	1 %	(0)	60 % **	(0)

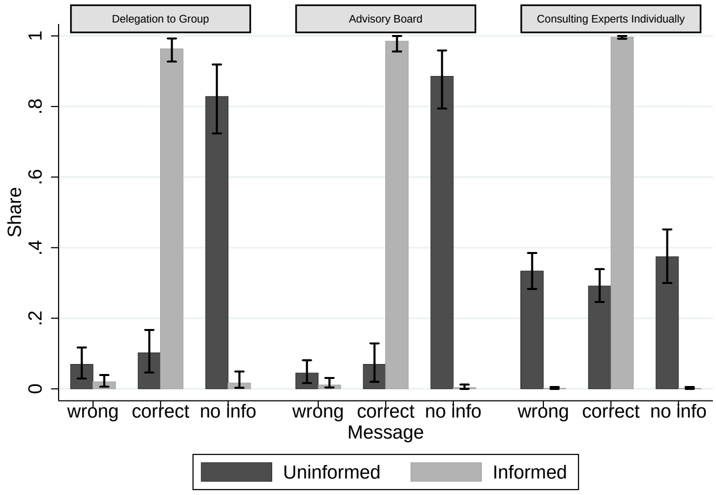
Notes: The first number in the $C = 0$ row and DG columns is the relative frequency of information acquisitions when the group has the decision power, the second number is the relative frequency of information acquisitions when the principal has the decision power. $^{**}p < 0.05$ denotes the significance of the difference between DG and CI of a Wilcoxon signed-rank test of the equality of the median shares of acquisitions at the matching group level.

Appendix B provides regression analyses for every treatment and for competent and incompetent experts separately (Tables B2 and B3). These regressions, as well as the Wilcoxon signed-rank test for matched pairs of differences within matching groups, reveal that incompetent experts differ in their acquisition behavior between DG and CI only in the $C = 10$ treatment, and competent experts only in the $C = 30$ treatment. In both cases, DG leads to fewer information acquisitions.

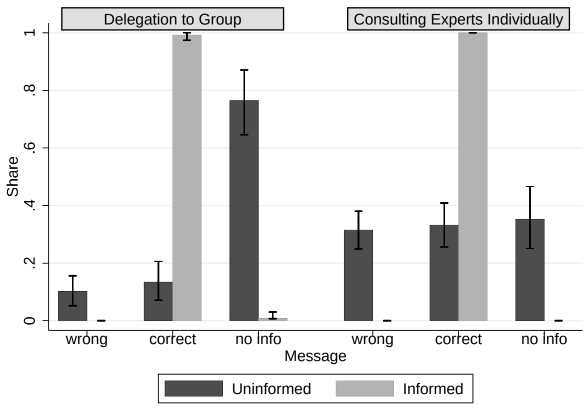
Experimental Result 2 (Information Aggregation): *Hypothesis 2 is confirmed. The share of messages honestly revealing the lack of information is significantly higher under DG than under CI.*

Figure 2 gives an overview of the messaging behavior in the experiment. The prediction that the informed experts honestly reveal the signal turns out to be almost completely accurate in the laboratory. Table 3 reports the result of OLS regressions for the probability of honestly reporting being uninformed with and without subject fixed-effects for each treatment. Under DG, the share of honest revelations of uninformed experts is significantly higher than under CI in all treatments. A Wilcoxon signed-rank test for the difference between the median shares under CI and DG of honest messages of uninformed experts within matching groups over all treatments also shows a highly significant difference ($p < 0.01$). Column (5) reports the results of an OLS regression for the probability of honestly reporting being uninformed under DG. This column reveals no significant differences between the messaging behavior of uninformed experts between the advisory-board and the delegation treatments.

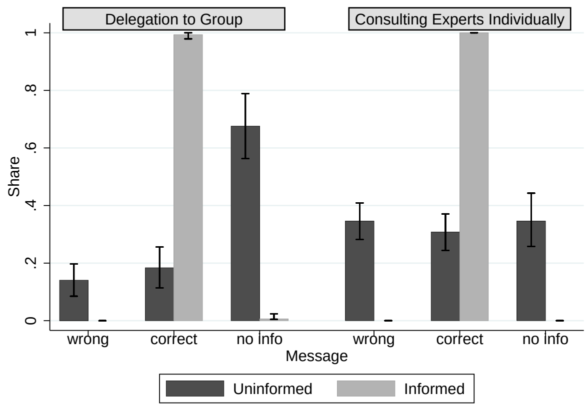
Under DG, information aggregation does not only depend on the messages sent, but also on the votes cast. Our theory predicts that informed experts should always vote for the correct state; uninformed experts who receive a meaningful message from the other expert should follow this message; and uninformed experts who do not receive an informative message should vote randomly. These predictions describe the subjects behavior accurately with 99.6% correct votes of informed experts, 95.5% correct votes of experts who are uninformed after the acquisition stage but receive an informative message from the other expert, and 56.3% votes for blue and 43.7% for red of uninformed experts who receive a 'no information' message.



(a) $Cost = 0$



(b) $Cost = 10$



(c) $Cost = 30$

Figure 2: Shares of different Messages submitted to Principal (CI) or other Expert (DG)

Notes: Uninformed experts do not know the true state of the world. An expert can be uninformed if he either did not acquire a signal, or (in case he is incompetent) received an uninformative signal. Whiskers represent 95% confidence intervals based on bootstrapped standard-errors (10,000 repetitions, with clustering at the individual level).

5.2 Decision Accuracy

Experimental Result 3 (Decision Accuracy): *DG leads to more correct decisions for the* $C = 0$ *and* $C = 30$ *treatments, while there is no significant difference in the* $C = 10$ *treatment. Hence, Hypothesis 3 is only confirmed for the* $C = 0$ *treatment.*

Figure 3 plots the share of correct decisions for each cost treatment and regime (DG or CI). As the theoretical predictions differ for different group compositions, the graphs also display the accuracy of decisions in all possible group compositions separately. The markers in the graph represent our theoretical predictions.

In the $C = 0$ treatments, without competent experts, as well as with one competent expert in a group, DG leads to a significantly higher median success rate than CI ($p = 0.02$ and $p < 0.01$).

Table 3: Honest Revelations of Ignorance

	Cost = 0, Gr. Dec.		Cost = 0, Prin. Dec.		$C = 0$ DG	Cost = 10		Cost = 30	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Delegation	0.436***	0.448***	0.537***	0.536***		0.416***	0.429***	0.341***	0.325***
	(0.041)	(0.042)	(0.088)	(0.086)		(0.038)	(0.051)	(0.066)	(0.066)
Competent	0.115*	-0.024	-0.832***	-0.698***	-0.359	-0.167	-0.109	-0.254***	-0.107**
	(0.055)	(0.021)	(0.037)	(0.039)	(0.341)	(0.123)	(0.071)	(0.036)	(0.031)
$C = 0\times$ *Prin. Dec.*					-0.057				
					(0.064)				
const.	0.450***		0.295***		0.887***	0.368***		0.407***	
	(0.054)		(0.079)		(0.053)	(0.031)		(0.048)	
Obs.	512	512	496	496	490	571	571	740	740
Clusters	8 MG	8 MG	8 MG	8 MG	16 MG	8 MG	8 MG	8 MG	8 MG
Fixed Effects	NO	YES	NO	YES	NO	NO	YES	NO	YES
R^2	0.211	0.534	0.294	0.525	0.011	0.182	0.556	0.159	0.463

Notes: OLS regressions with the $[0,1]$-indicator variable for the message *"I do not have information"* as the dependent variable. Informed experts are not included in the regression. Standard-errors (in parentheses) are clustered at the matching-group level. *Delegation* is a dummy variable for DG rounds, where the message is sent to the other expert instead of to the principal. Column (5) shows the results of an OLS regression for the DG rounds of both $C = 0$ treatments. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

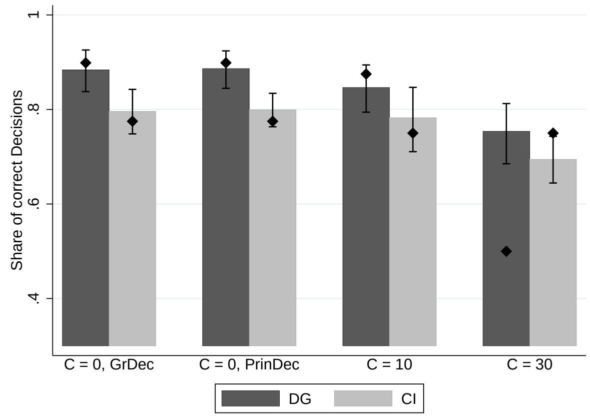
With two competent experts, CI leads to a weakly higher median success probability than DG ($p = 0.08$).[22] Weighting the outcomes of the group compositions with the respective probabilities of their occurrence and performing the Wilcoxon signed-rank test for the overall decision accuracy shows that DG significantly outperforms CI ($p < 0.01$).[23]

For the $C = 10$ treatment, we find no significant differences in the median shares of correct decisions between the regimes for rounds with two incompetent or two competent experts ($p = 0.89$ and $p = 0.93$), as predicted. We find a weakly significantly higher decision accuracy under DG than CI for rounds with one incompetent and one competent expert ($p = 0.09$). Weighting all accuracies under different group compositions with their probability of occurrence and performing the test reveals no significant difference between CI and DG ($p = 0.124$).

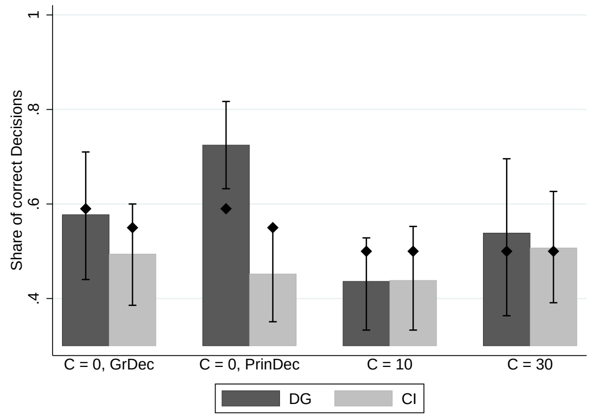
For the $C = 30$ treatment, our Wilcoxon signed-rank test between the accuracy rates in a matching group under the two regimes shows no significant difference in groups with no or with two competent experts ($p = 0.23$ and $p = 0.36$) and a weakly significantly higher decision accuracy under DG than under CI in case of one competent expert in a group ($p = 0.08$). Weighting the decision accuracies in a matching group with the different group composition probabilities and performing the test shows that the accuracy rate under DG is, overall, significantly higher than under CI ($p = 0.012$).

[22]This result stems from principals who do not follow the group recommendation in the treatment where the principals keep the decision power (as can also be seen in Figure 3).

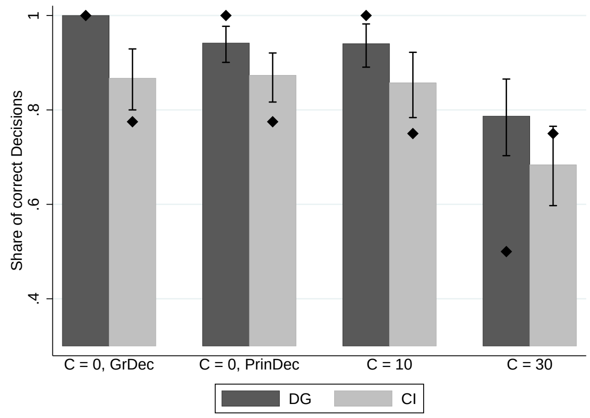
[23]We refer the reader to Table B8, in Appendix B, for parametric, regression-based tests of the equality of the means, which lead to qualitatively the same picture as the Wilcoxon signed-rank test results that we report in the text.



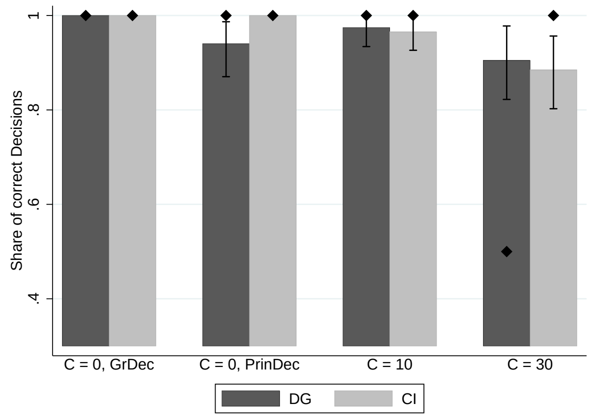
(a) All Data



(b) Groups without a Competent Expert



(c) Groups with one Competent Expert



(d) Groups with two Competent Experts

Figure 3: Share of Correct Decisions under DG and CI in the Different Treatments

Notes: Markers depict the theoretical predictions. Whiskers represent 95% confidence intervals based on bootstrapped standard-errors (10,000 repetitions, with clustering at the group level).

5.3 Principals' Behavior

Experimental Result 4 (Delegation Decisions): *Hypothesis 4 can only be partly confirmed. An expert group without decision power is consulted more often than an expert group with decision power but the number of delegation decisions is (statistically insignificantly) greater with $C = 30$ than with $C = 0$, while we predicted the opposite.*

In the treatments where the principal has decision power under DG, she follows the suggestion of the committee in 98.5% of the cases. In the CI regimes, the principals follow one informative message in 97% of the cases, and two informative messages in 100% of the cases.

In the 21^{st} round, each principal determines which regime is played in the remaining three rounds. 25% (37%, 33%) of the principals choose DG in the treatment with 0 (10, 30) cost of information when delegation comes with the loss of the decision right. In the additional treatment, in which the decision power stays with the principal, a majority of 54% of the principals still

Table 4: Decision to Delegate

	(1)	(2)	(3)	(4)
Cost $= 0$	-0.083	-0.083	-0.126	-0.126*
	(0.081)	(0.084)	(0.082)	(0.068)
Cost $= 10$	0.042	0.042	0.029	0.035
	(0.113)	(0.111)	(0.108)	(0.0842)
Cost $= 0\times$	0.208	0.208*	0.204*	0.198**
Principal Power	(0.132)	(0.111)	(0.107)	(0.0934)
order: CI first		0.208**	0.178**	0.213***
		(0.078)	(0.077)	(0.061)
Decision-Payoff			0.021***	0.020***
DG - CI			(0.004)	(0.004)
Evaluation-Payoff				0.013***
DG - CI				(0.003)
constant	0.333	0.229	0.188	0.278
	(0.070)	(0.059)	(0.108)	(0.054)
Observations	96	96	96	96
N clusters	32	32	32	32
R^2	0.025	0.072	0.216	0.305

Notes: OLS regression with the decision to delegate (have the experts form an advisory board in the additional treatment) in Period 21 as the dependent variable. Standard-errors (in parentheses) are clustered at the matching-group level. Decision- and Evaluation-Payoff denote the principals' payoff difference in experimental points between DG and CI of the first 20 rounds, divided by the number of rounds per regime (10). All other variables are treatment dummies.
* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

choose CI. These decisions might be driven by different experiences of the principal with respect to different payoffs between the regimes, which might result from the randomly determined group compositions. Table 4 reports results from an OLS regression where we control for this. Furthermore, we control for the order of regimes, and the evaluation payoff difference. These regressions reveal that an advisory board without decision power is consulted (weakly) significantly more often than a committee with decision power.[24] Other significant predictors for choosing DG with a higher probability are starting with CI and playing DG afterwards, and more positive experiences with DG than with CI in the first 20 rounds.

The share of principals who chose CI in the additional treatment is still quite high, at 54%. The most prominent explanation for too few delegation choices – an intrinsic utility of having the right to decide – can therefore only offer a partial explanation of our findings.

[24]A Wilcoxon rank-sum test shows no significant difference between the two $C = 0$ treatments in the share of delegation decisions within a matching group ($p = 0.17$).

5.4 Observers' Evaluations

Figure 4 plots the distribution of evaluations. The theoretical PBE prediction as well as the optimal (best response) evaluation given experts' actual behavior is plotted as vertical, dashed lines.

The distribution of evaluations after correct and incorrect messages is significantly different throughout all three CI treatments (Kolmogorov-Smirnov tests, $p < 0.01$). The difference between evaluations after a 'no information' message and a wrong message is significantly different for the no-cost and the $C = 10$ treatment (Kolmogorov-Smirnov test, $p < 0.01$) but insignificant in the $C = 30$ treatment (Kolmogorov-Smirnov test, $p = 0.13$). In the DG treatments, the difference between the distribution of evaluations following a wrong and a correct group-decision (group-message) is significant for all three treatments (Kolmogorov-Smirnov tests, $p < 0.01$).

We see that the correctness of an individual advice or a group decision has a substantial effect on the average observer's evaluation, which provides the incentives for information acquisitions.

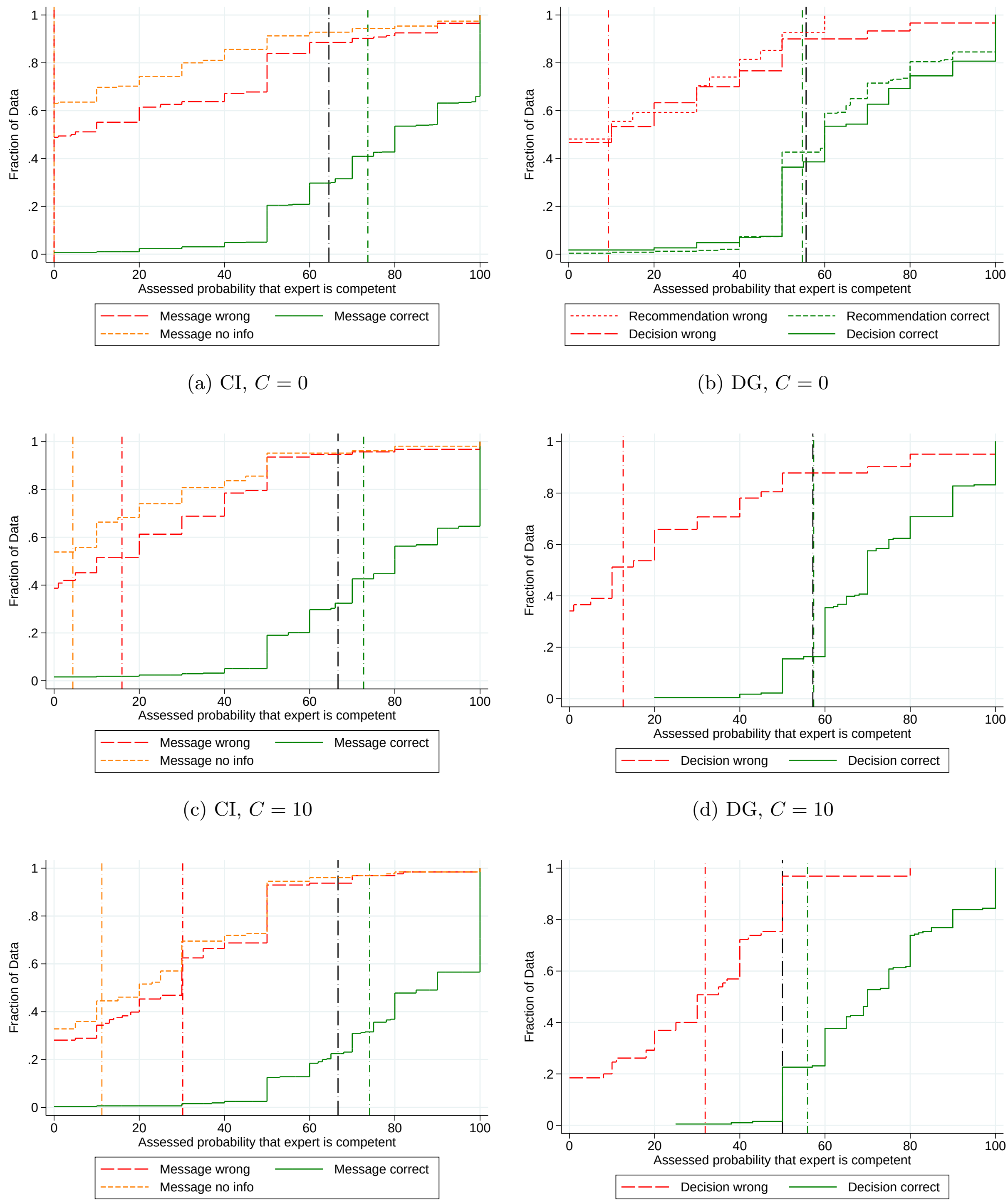
5.5 Potential Reasons for Deviations from Hypothesized Behavior

Our analysis has revealed a couple of deviations from our theoretical predictions; the over-acquisition of signals by competent experts in the $C = 30$ treatment under DG, and the under-delegation of principals, are the most striking. In the following, we shed some light on potential reasons for these deviations. For this purpose, we first analyze in how far the observed information acquisitions might be a best response to the incentives that result from the behavior of other subjects, which might differ from the incentives in the theoretically predicted equilibrium. Second, we report the data of the sessions with larger matching groups to explore potential repeated game effects during the experiment. Third, we will look at changes in behavior over time, which might give us a hint on learning. Finally, we will present the reasons that subjects themselves gave for information acquisition and delegation in the post-experimental questionnaire.

5.5.1 Best Responses to the Behavior of other Subjects

As neither principals nor experts behaved perfectly in line with equilibrium predictions, we check to what extent the acquiring behavior of the experts is a best response to the actual evaluations of the observers. Taken the (average) evaluation of observers for each case as given, we calculate whether it is optimal to acquire information for the different types.

Consulting the Experts Individually In the $C = 0$ treatment, the difference of the average assessment regarding being competent between sending a correct message and an incorrect message equals $77.76 - 24.90 = 52.86$ percentage points. As there are no costs, it is always optimal to acquire information. Incompetent experts can expect to submit a correct message with probability 0.55 if they acquire information, and with probability 0.5 if they do not. The (net) benefit of drawing a signal is $(0.55 - 0.5) \cdot 77.76 + (0.45 - 0.5) \cdot 24.90 = 2.64$. For competent experts there is no



(a) CI, $C = 0$

(b) DG, $C = 0$

(c) CI, $C = 10$

(d) DG, $C = 10$

(e) CI, $C = 30$

(f) DG, $C = 30$

Figure 4: CDFs of the Observers' Evaluations

Notes: Vertical dashed lines correspond to the empirical best-response evaluation. The black long-dashed vertical line depicts the theoretical prediction after a correct message (CI) or decision (DG).

uncertainty if they acquire information, and the (net) benefit of drawing a signal is therefore $\frac{1}{2} \cdot (77.76 - 24.90) = 26.43$.

Repeating this exercise for the $C = 10$ treatment leads to a benefit of $0.05 \cdot (77.10 - 21.87) = 2.76$ for the incompetent experts, which is smaller than the costs of 10, and $\frac{1}{2} \cdot (77.10 - 21.87) = 27.62 > C = 10$ for the competent experts. In the $C = 30$ treatment, the evaluation behavior of the principals leads to a benefit of $0.05 \cdot (82.19 - 27.47) = 2.74 < C = 30$ for the incompetent experts and $\frac{1}{2} \cdot (82.19 - 27.47) = 27.36 < C = 30$ for the competent experts.

In the treatment with high costs, it is thus not optimal for competent experts to acquire information, which is against our predictions and might explain why the relative frequency of acquisitions is, indeed, lower than the theoretical prediction of 100%. At 70% it is also much higher than the best response would have been in the experiment (0%). However, the incentive not to acquire a signal is weak.

Delegation to the Group To calculate the value of receiving a signal under DG, we have to take into account the probability of being matched with a competent expert, 0.5, as well as the average acquiring probabilities of these experts.[25] In the $C = 0$ treatment, the (net) benefit of receiving a signal – that is, the expected increase in evaluation – for an incompetent (competent) expert is 1.03 (10.33).

In the $C = 10$ treatment, the benefit of drawing a signal for incompetent experts is $1.35 < C = 10$, and $13.54 > C = 10$ for competent experts, which shows that it is indeed optimal to acquire information for competent experts only, as predicted. For the $C = 30$ treatment, the benefit of receiving a signal is $1.47 < C = 30$ for incompetent experts, and $14.68 < C = 30$ for competent experts. This shows, that the competent experts under DG in the $C = 30$ treatment could have increased their expected payoff substantially by not acquiring a signal, which is also what our theory predicts.

5.5.2 Time Effects

Repeated Game Effects As our model does not focus on repeated game effects, we implemented stranger matching between principal and experts between rounds. With 23 rounds and matching groups of 9, however, one could argue that the likelihood of being matched with the same expert in a group (DG) is high enough to lead to repeated game effects. As the DG setup for the experts is similar to a public goods setup, repeated game effects might lead to an over-acquisition of information. To explore this possibility, we conducted two sessions of the $C = 30$ treatment with matching groups of 18 subjects. The finding of over-acquisition is robust to the size of the matching groups. With matching groups of 9 (18), the relative frequency of information acquisition of competent experts under DG in the $C = 30$ treatment is 59.5% (56.3%). Table 5 shows that this difference is far from significant, irrespective of the level at which we cluster the standard errors.

[25]The share of informed experts that submit the correct message exceeds 99%, and 99.6% of the informed experts also vote for the correct state irrespective of the other's message.

Table 5: Information Acquisition under DG and the size of the Matching Groups

	(1)	(2)	(3)
Large Matching Groups	-0.032	-0.032	-0.032
	(0.054)	(0.094)	(0.062)
constant	0.595***	0.595***	0.595***
	(0.031)	(0.059)	(0.062)
Observations	388	388	388
N clusters	-	72 Subj.	10 MG
R^2	0.001	0.001	0.001

Notes: OLS regression of the decision of competent experts to acquire information in the $C = 30$ treatment under DG as the dependent variable. Standard-errors are reported in parentheses. *Large Matching Groups* consist of 18 subjects (12 experts), the other matching groups consist of 9 subjects (6 experts). * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

With respect to the messaging behavior, we also see no significant difference between the differently sized matching groups (see Table B7 in Appendix).

Learning Given the more or less costly deviations from best-response behavior that we observe in the data, we next analyze if subjects adapt their behavior over time. To test for learning over time, we split our observational sample of periods 1–20 into two groups per regime: the first five rounds of a regime and the last five.[26] In all cases we compare the relative frequency of choices within a matching group in the two halves with a Wilcoxon signed-rank test.

First, we note that the accuracy of the observers' evaluations does not increase over time. Their payoffs for the accuracy of their stated beliefs do not significantly differ between the first five rounds and the subsequent five rounds, either under CI, or under DG.[27]

Next, we turn to information acquisition. Figures B1 and B2 in the Appendix depict the shares of information acquisition for each period and serve as an overview of the acquisition behavior over time. In the $C = 30$ treatment we saw that many competent experts do not play a best response under CI and buy information even if it does not pay off to do so. The relative frequency of information acquisitions is 76% in the first half of the CI rounds and decreases to 67% in the second half of the CI rounds. However, we do not find a statistically significant difference between the distributions ($p = 0.26$).[28] Under DG, where we also observed an over-acquisition of information of competent experts, the acquisition rate again declines over time, but again not statistically significantly so: 69% in the first half of the periods and 55% in the second half.[29]

With respect to the information aggregation, we saw that the share of uninformed experts who honestly reveal their ignorance under DG is 78%. As theory predicts every uninformed expert will

[26] As the regime played in round 21–23 is endogenously determined and therefore not played by every subject, we exclude these last three rounds in the analysis of behavior over time.

[27] The Wilcoxon signed-rank test between the average evaluation payoff within the matching groups remains insignificant between the two halves under CI ($p = 0.81$) and DG ($p = 0.36$).

[28] Repeating the Wilcoxon signed-rank test on subject level instead of matching group level also shows an insignificant difference ($p = 0.12$).

[29] $p = 0.11$ for comparison of shares within a matching group, and $p = 0.18$ for comparisons on the subject level.

send the ‘no information’ message, we now check whether this share increases over time. Figure B3 in the Appendix plots the share of honest messages of uninformed experts over time. Comparing again the first five rounds to the subsequent five rounds under DG, no significant difference is detected: 78% vs. 79% ($p = 0.58$). Under CI, where theory predicts that no uninformed expert would honestly reveal their ignorance to the principal, 36% of their messages are the honest ‘no information’ message. This high share might result from either a preference for honesty or from not understanding the incentive to lie properly. While 44% of the messages are honest revelations of ignorance in the first five rounds, this number decreases to 30% in the subsequent five rounds and our test indicates a statistically significant difference ($p < 0.01$). This finding suggests that at least some experts adapt their behavior over time in the direction of best-response behavior.

5.5.3 Endogenous vs. Exogenous Regime Choice

In the third part of the experiment, the principal decides about the regime that is played within her own group. To punish (reward) the principal for her choice of regime, reciprocal experts could potentially acquire less (more) information, be less (more) honest about not knowing the state of the world, or lie more (be more truthful) about the state of the world in case they are informed. To test if experts, indeed, change their behavior in the rounds where the principal determines the regime, we test for differences in the acquisition and messaging behavior (Tables B4, B5 and B6 in the Appendix).[30] We neither find a significant difference in the acquisition behavior of incompetent (Table B4) nor of competent experts (Table B5) between exogenous and endogenous regime implementation. Similarly, the communication of informed and uninformed experts is not affected by the endogenity of the regime choice (Table B6).[31]

5.5.4 Self-Stated Reasons

After the experiment, the subjects fill out a non-incentivized questionnaire including questions on socio-demographic characteristics and open questions about the underlying behavior of the game. The answers to two open questions give some hints on the reasoning behind the observed over-acquisition of information and the under-delegation of decisions.

Stated Reasons for Information Acquisition Subjects who play in the role of an expert are asked *‘What influenced your decision to draw a ball?’* and can answer in their own words. We categorize the answers to check how many experts mention the difference between being competent or incompetent (category ‘Competence’), and how many answers relate to playing under CI or DG

[30] For a clean comparison between endogenous DG and endogenous CI regime, we exclude the data of the group consultancy treatments for the estimations in Table B6.

[31] Moreover, the elicited beliefs from the two additional sessions provide no indication of systematic changes in the beliefs about the experts’ acquisition behavior between the parts with exogenous and endogenous regime choice. Note, though, that the number of observations (from 12 principals) is too small to be conclusive.

(category 'Regime').[32] Table 6 gives an overview of the categorized answers. While 88% (87%) of the given answers in the $C = 10$ ($C = 30$) treatment refer to competence, the regime is only mentioned in 9% (3%) of the answers. These results suggest that the free-riding incentive under DG is not very salient, which might to some extent explain the over-acquisition of information in the $C = 30$ treatment.

Table 6: Self-Reported Reasons for Information Acquisition

	Cost = 0	Cost = 10	Cost = 30
Always Draw	60	0	0
Costs	0	5	4
Competence	16	38	33
Regime	2	4	1
Other	9	4	4
Num. of Answers	84	43	38
Num. of Subjects	96	48	48

Notes: Categorization of answers to question: 'What influenced your decision to draw a ball?'. Answers can fall into multiple categories.

Stated Reasons for (not) Delegating More than half of the principals in every treatment choose CI. One of the post-experimental questions for the principals reads *'What influenced your decision about the regime (at the beginning of part 3)?'*, and subjects answer it in free form. The range of different answers is broad, but some categories stand out. Table 7 gives an overview.

Table 7: Self-Reported Reasons for Choice of DG/CI

	Choice: CI				Choice: DG			
	Gr. Dec. C=0	Prin. Dec. C=0	C=10	C=30	Gr. Dec. C=0	Prin. Dec. C=0	C=10	C=30
Decision Power & Interference of Others	10	1	6	9	1	-	-	-
Fun	1	1	1	2	-	1	-	-
Higher Payoff	3	2	3	2	1	5	6	1
Evaluation	2	2	1	-	1	1	-	-
Curiosity	1	2	1	-	-	2	-	-
More Signals Better	-	4	-	-	-	-	-	-
Other	-	1	1	2	3	1	2	3
Num. of Answers	15	12	12	15	5	10	8	4
Num. of Subjects	18	13	15	16	6	11	9	8

Notes: Categorization of answers to question: 'What influenced your decision about the regime?'. Answers can fall into multiple categories.

Having the right to decide or not having another party interfere is often mentioned by principals choosing CI (category 'Decision Power & Interference of Others'); the exception is our additional

[32] Further categories are 'Always Draw', which is a frequent answer in the $C = 0$ treatments, and 'Costs'. Other answers are subsumed under the category 'Other'.

treatment, in which they always keep the decision power. Reassuringly, from a theoretical point of view, the second most-often chosen category is 'Higher Payoff'. Other stated reasons are greater entertainment/ fun during the experiment (category 'Fun'), and curiosity about the experts' messages (category 'Curiosity'). Some principals also stated the easier evaluation in their role as observer (category 'Evaluation'), although we made it very clear in the instructions and on the screen that the decision counts for the individual's own group only, while the observation is done for a different group. Four principals in our additional treatment reported seeing more signals to be superior to seeing only one signal (category 'More Signals Better') without further explanation.

6 Discussion and Conclusion

Our investigation of delegation of decision-making to a group brings together two strands of literature – the delegation and the committee decision-making literatures – and points to a number of aspects that arise in this novel setting. Our theoretical analysis highlights an important trade-off between information acquisition and information aggregation, which depends on the cost of information. The key results in this respect is Proposition 1, which states that there always exists (1) a low-cost range in which delegation of decision-making to the group of experts leads to better results than consulting the experts individually, (2) a middle cost range in which consulting individually outperforms delegation, and (3) a cost threshold above which both regimes lead to the same outcome. Confirming theoretical predictions, we find in the laboratory that information aggregation works better under delegation, whereas more information is acquired in case experts are consulted individually when the cost of information is sufficiently high. However, our experimental results also deviate from the model's predictions in some respects.

First of all, we find that under delegation and high costs of information the positive effect of better information aggregation still outweighs the negative effect of lower information acquisition. The main reason for this is that more experts buy information than predicted. Our analysis in Section 5.5 reveals that this is quite costly for the experts and clearly not a best response to the behavior of the other subjects. Over-acquisition of information has also been observed in a number of other studies, suggesting that subjects might in fact have a positive willingness to pay for information even if it has low instrumental value (e.g., Großer and Seebauer, 2016, 2017; Bhattacharya et al., 2017). The answers that subjects gave in our post-experimental questionnaire (Table 6) suggest that many subjects did not take the regime, and thus a potential free-riding incentive under delegation, into account but only focused on their own competence level and the cost of information.

The second important deviation from our theoretical predictions is the low number of decisions to delegate by the principals. This might have been expected given similar findings from experiments on delegation to a single agent (e.g., Fehr et al., 2013; Bartling et al., 2014). To dig deeper, we designed an additional treatment, in which the decision right is not transferred to the experts but the principal can decide to either consult them individually or to have them form an advisory board. While fewer principals choose to consult individually in the new treatment, which is consistent with the idea that they value the decision right *per se* (Bartling et al., 2014), more than half of them still prefer to do so, thereby forgoing the benefit of improved information aggregation and more accurate decisions. While the answers to our post-experimental questionnaire (Table 7) quite clearly show that keeping the decision power or avoiding interference from others is an important reason to choose to consult individually in our main treatments, they are less clear about the reasons in our additional treatment. Half of the principals who chose to consult individually there, stated that seeing more signals was better or gave curiosity as a reason.

Despite these deviations from our theoretical predictions, we see important differences in experts' behavior and the resulting decision accuracies between the two regimes. Hence, the choice whether or not to delegate decisions to groups of experts appears to be important for organizational success and thus deserves more attention. Future studies could shed more light on this: for example, by studying different scenarios with respect to the nature of the friction between the principals' and the agents' objectives. They could also seek new insights into the reasons behind, and the consequences of, the apparently very robust reluctance of principals to delegate decisions, and the tendency of experts to overinvest in information – both of which have now been observed in a number of different experimental settings.

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A Theoretical Appendix

To prove Proposition 1, we construct the type-symmetric equilibria for CI and DG over the whole range of C. There are three different sorts of equilibria: 1) the most-informative equilibria, in which the final decision is based on the greatest amount of information possible, described in A1 and A2, 2) mixed strategy equilibria in which incompetent experts never acquire information and competent experts are indifferent in their acquisition choice, described in A3, and 3) babbling equilibria, in which no information is acquired and no updating of the principal takes place. It is easy to see that it can never be optimal to buy information and then not communicate it, neither under CI nor under DG, where the experts are in a common value situation after the information acquisition stage and truthful communication is possible in equilibrium. Hence, under DG the most-informative equilibria will be the equilibria in which the greatest amount of information is acquired. Under CI, this is also true but the acquired and communicated information of informed experts can be diluted by random messages of uninformed experts trying to mimic informed experts. As long as there can be informed experts in equilibrium (that is, when C is not too high), these will more likely be the competent experts and the incentive to mimic cannot be avoided. Under DG, the information acquisition stage is followed by truthful communication, and a group decision for the decision that is more likely to match the state of the world or a 50-50 random decision in case the committee is uninformed. Under CI, the information acquisition stage is followed by truthful communication of informed experts and 50-50 random messages $M_j \in \{A, B\}$ of uninformed experts, and a principal's decision for the decision recommended in the majority of messages, or a random decision in case of a tie.[33] In the following, $\hat{\pi_i}$ and $\hat{\pi_c}$ represent the beliefs of the principal about the acquisition probability of an incompetent and a competent expert, respectively. In equilibrium, the best-response acquiring probabilities of the experts (π_i and π_c) given the believed acquiring probabilities ($\hat{\pi_i}$ and $\hat{\pi_c}$) have to match the latter.

A1 Most-Informative Equilibria under CI

In the most-informative equilibrium that occurs in the low-cost range, both types of experts acquire information with certainty.

CI all-buy equilibrium $(\hat{\pi_i}, \hat{\pi_c}) = (1, 1)$**:** If every informed expert i sends $M_i = S$, and uninformed experts u send $M_u = S$ and $M_u \neq S$ with equal probability, it is optimal for the principal to take the decision recommended by the majority of messages. In case the messages contradict each other and there is a tie, the principal is indifferent between the options and cannot do better than choosing $D \in \{A, B\}$ randomly. As ties can only occur in case of an even number of experts n, the

[33] The 50-50 mixing probabilities of uninformed experts stem from the fact that any other mixing probability would lead to a lower expected posterior belief of the principal (regarding the expert's competence) following the decision that is chosen with higher probability. Hence, any expert (with positive probability of being pivotal) could benefit from deviating by voting for the other option. Only when either the individual decision which message to send (under CI) or the group decision (under DG) is made with equal probability no such profitable deviation exists. An uninformed principal can, of course, decide randomly with arbitrary probabilities.

ex ante probability of $D = S$ differs for even and uneven number of experts. In the equilibrium where both types of experts acquire information with certainty, the resulting (expected) decision accuracy is:

$$Pr(D = S|\pi_i = \pi_c = 1, CI) = \begin{cases} \sum_{k=0}^{n}\binom{n}{k}\lambda^{n-k}(1-\lambda)^k(\sum_{i=0}^{k}\binom{k}{k-i}p^{k-i}(1-p)^i(\frac{\sum_{j=0}^{\frac{n}{2}-1}\binom{i}{i-j}+\frac{1}{2}\binom{i}{i-\frac{n}{2}}}{2^i})) & \text{for } n \text{ even} \\ \sum_{k=0}^{n}\binom{n}{k}\lambda^{n-k}(1-\lambda)^k(\sum_{i=0}^{k}\binom{k}{k-i}p^{k-i}(1-p)^i(\frac{\sum_{j=0}^{\frac{n-1}{2}}\binom{i}{i-j}}{2^i})) & \text{for } n \text{ odd.} \end{cases} \tag{A.1}$$

The posterior probabilitiy of competence depends on the message and the true state, but not on the other experts' behavior. Expecting uninformed experts to randomly submit $M \in \{A, B\}$, the probability is $Pr(t = c|M = S) = \frac{2\lambda}{1+\lambda+p-\lambda p}$ and $Pr(t = c|M \neq S) = 0$. Incompetent experts acquire information as long as the expected utility from doing so exceeds the one from not buying and still sending the correct message with probability 0.5. Hence, information is acquired as long as $\frac{1}{2}(p+1)Pr(t = c|M = S) - C \geq \frac{1}{2}Pr(t = c|M = S)$. Solving for C results in

$$C \leq \frac{p\lambda}{1+\lambda+p(1-\lambda)}. \tag{A.2}$$

In case C is lower than this threshold, there is a Perfect Bayesian Equilibrium in which both types of experts acquire information with certainty. For $C > \frac{p\lambda}{1+\lambda+p(1-\lambda)}$, however, the equilibrium cannot be maintained, as incompetent experts would benefit from deviating and not buying.[34]

In the most-informative equilibrium that occurs for medium-low costs, competent experts acquire information with certainty, and incompetent experts mix between acquiring and not acquiring information.

CI most-informative mixed-strategy equilibrium $(\hat{\pi_i}, \hat{\pi_c}) = (\pi_i^{MSE,CI}, 1)$**:** The equilibrium behavior of informed experts i is again to send $M_i = S$, of uninformed experts u to randomly send $M_u \in \{A, B\}$, and of principals to take the decision that equals the highest number of messages (or take a random decision in case of a tie). The resulting success probability are: $Pr(D = S|\pi_i = \pi_i, \pi_c = 1, CI) = \sum_{k=0}^{n}\binom{n}{k}\lambda^{n-k}(1-\lambda)^k(\sum_{i=0}^{k}\binom{k}{k-i}\pi^{k-i}(1-\pi)^i(\sum_{j=0}^{k-i}\binom{k-i}{k-i-j}p^{k-j}(1-p)^j(\frac{\sum_{t=0}^{\frac{n}{2}-1}\binom{j}{j-t}+\frac{1}{2}\binom{j}{j-\frac{n}{2}}}{2^j}))))$ for n even, and $Pr(D = S|\pi_i = \pi_i^{MSE,CI}, \pi_c = 1, CI) = \sum_{k=0}^{n}\binom{n}{k}\lambda^{n-k}(1-\lambda)^k(\sum_{i=0}^{k}\binom{k}{k-i}\pi^{k-i}(1-\pi)^i(\sum_{j=0}^{k-i}\binom{k-i}{k-i-j}p^{k-j}(1-p)^j(\frac{\sum_{t=0}^{\frac{n-1}{2}}\binom{j}{j-t}}{2^j}))))$ for n odd. To calculate the equilibrium acquisition probability of the incompetent experts $\pi_i^{MSE,CI}$, we again have to analyze the Bayesian updating of the principal. Knowing the dominant strategies and the equilibrium acquisition probabilities, the ex post probability to observe a competent expert is $Pr(t = c|M = S) = \frac{2\lambda}{1+\lambda+p\pi-\lambda p\pi}$ and $Pr(t = c|M \neq S) = 0$. Given this belief updating, incompetent experts are indifferent between acquiring or not if $\pi_i^{MSE,CI}(C, \lambda, p) = \frac{C+C\lambda-\lambda p}{Cp(\lambda-1)}$. Since $0 \overset{!}{\leq} \pi_i^{MSE,CI} \overset{!}{\leq} 1$

[34]Note that the competent experts' best response follows immediately from that of the incompetent experts in this case, as the competent experts face the same information acquisition costs as the incompetent ones but benefit more from it (as $p < 1$ by assumption). Thus, if it is optimal for the incompetent experts to acquire a signal, competent experts will do the same.

the described mixed-strategy equilibrium exists if $\frac{p\lambda}{1+\lambda+p(1-\lambda)} \leq C \leq \frac{p\lambda}{1+\lambda}$. For costs exceeding this threshold, there can be no equilibrium where incompetent experts acquire information with a positive probability.

In the most-informative equilibrium that occurs for medium-high costs, competent experts acquire information with certainty, while incompetent experts do not acquire information.

CI competent-experts-buy equilibrium $(\hat{\pi}_i, \hat{\pi}_c) = (0, 1)$**:** Following the same logic as in the previous cases, the expected decision accuracy is:

$$Pr(D = S|\pi_i = 0, \pi_c = 1, CI) = \begin{cases} \sum_{k=0}^{n} \binom{n}{k} \lambda^{n-k}(1-\lambda)^k \frac{\sum_{i=0}^{\frac{n}{2}-1} \binom{k}{k-i} + \frac{1}{2}\binom{k}{k-\frac{n}{2}}}{2^k} & \text{for } n \text{ even} \\ \sum_{k=0}^{n} \binom{n}{k} \lambda^{n-k}(1-\lambda)^k \frac{\sum_{i=0}^{\frac{n-1}{2}} \binom{k}{k-i}}{2^k} & \text{for } n \text{ odd.} \end{cases} \tag{A.3}$$

The principal updates her beliefs as follows: $Pr(t = c|M = S) = \frac{2\lambda}{\lambda+1}$ and $Pr(t = c|M \neq S) = 0$. For competent experts information acquisition is a best response as long as:

$$C \leq \frac{\lambda}{\lambda + 1} =: C'''. \tag{A.4}$$

For cost levels above C''', the decision accuracy will necessarily equal the prior probability of 50% and the posterior probability of competence will equal the prior probability of λ.

A2 Most-Informative Equilibria under DG

In the most-informative equilibrium that occurs in the low-cost range, both types of experts acquire information with certainty.

DG all-buy equilibrium $(\hat{\pi}_i, \hat{\pi}_c) = (1, 1)$**:** With truthful communication in the group, having one informed expert in a group is enough to arrive at a correct decision with certainty. Thus the resulting expected decision accuracy is:

$$Pr(D = S|\pi_i = \pi_c = 1, DG) = 1 - \frac{1}{2}(1-\lambda)^n(1-p)^n. \tag{A.5}$$

The principal updates her beliefs about the competence of every expert in the group as follows: $Pr(t = c|D = S) = \frac{\lambda}{1-\frac{1}{2}(1-\lambda)^n(1-p)^n}$ and $Pr(t = c|D \neq S) = 0$. Incompetent experts acquire information as long as the expected utility from doing so exceeds that from not buying. As the utility of information does not depend on the identity of the expert who paid the costs for it, $EU_i(buy) = Pr(t = c|D = S)(1 - \frac{1}{2}(1-\lambda)^{n-1}(1-p)^n) - C$ and $EU_i(not\ buy) = Pr(t = c|D = S)(1 - \frac{1}{2}(1-\lambda)^{n-1}(1-p)^{n-1})$. Plugging in $Pr(t = c|D = S)$ and rearranging for C yields the following condition:

$$C \leq \frac{\lambda p(1-\lambda)^{n-1}(1-p)^{n-1}}{2-(1-\lambda)^n(1-p)^n} =: C'(n, \lambda, p). \tag{A.6}$$

For costs exceeding $C'(n, \lambda, p)$, there cannot be an equilibrium where incompetent experts acquire information with certainty.

In the most-informative equilibrium that occurs for medium-low costs, competent experts acquire information with certainty, and incompetent experts play a mixed strategy in their acquisition behavior.

DG most-informative mixed-strategy equilibrium $(\hat{\pi}_i, \hat{\pi}_c) = (\pi_i, 1)$**:** If an incompetent expert acquires information with probability π_i, the decision accuracy is given by $Pr(D = S|\pi_i = \pi, \pi_c = 1, DG) = 1 - \frac{1}{2}(1-\lambda)^n(1-\pi p)^n$. Principals update their beliefs about the competence as follows: $Pr(t = c|D = S) = \frac{\lambda}{1-\frac{1}{2}(1-\lambda)^n(1-\pi p)^n}$ and $Pr(t = c|D \neq S) = 0$. The equilibrium acquiring probability is decreasing in C and becomes zero when $C = \frac{p\lambda(1-\lambda)^n}{((1-\lambda)^n-2)(\lambda-1)}$. For costs exceeding this threshold, there cannot be an equilibrium where incompetent experts acquire information with positive probability.

In the most-informative equilibrium that occurs in the high-medium-cost range, all competent experts acquire information, but incompetent experts do not.

DG competent-experts-buy equilibrium $(\hat{\pi}_i, \hat{\pi}_c) = (0, 1)$**:** The expected decision accuracy is: $Pr(D = S|\pi_i = 0, \pi_c = 1, DG) = 1 - \frac{1}{2}(1-\lambda)^n$. The posterior probability of an individual group member being competent is: $Pr(t = c|D = S) = \frac{\lambda}{1-\frac{1}{2}(1-\lambda)^n}$ and $Pr(t = c|D \neq S) = 0$. Competent experts acquire information as long as the expected utility from doing so exceeds the one from not buying. For the competent experts, the expected utility from acquiring information exceeds the one of remaining uninformed as long as:

$$C \leq \frac{\lambda(1-\lambda)^{n-1}}{2-(1-\lambda)^n} =: C''. \tag{A.7}$$

For $C > C''$, there is no equilibrium where any expert acquires information under DG. Hence, the decision accuracy will equal the prior probability of 50% and the posterior probability of competence will equal the prior probability of λ.

A3 Mixed-strategy equilibria under IC and DG

In addition to the most-informative equilibria characterized above, there also exist equilibria in mixed strategies, where the incompetent expert never acquires information for $C > 0$, and the competent expert is indifferent between acquiring and not acquiring information when C is not prohibitively high.[35] The equilibrium mixing-probability depends on the cost of information.

IC mixed-strategy equilibrium $(\hat{\pi}_i, \hat{\pi}_c) = (0, \pi_c)$**:** With positive information acquisition probability of the competent expert, the best-response to send $M = S$ in case one is informed, and

[35] In case $C = 0$, we assume both experts acquire information with certainty, which coincides with the most informative equilibrium.

$M_u = S$ or $M_u \neq S$ with equal probability in case one is uninformed remains. As $p < 1$ and $0 < \lambda < 1$ by assumption, if the competent expert is indifferent in whether to acquire information, the incompetent expert cannot be indifferent as well. Hence, the incompetent expert best-response by not acquiring information: $\pi_i = 0$. With these underlying strategies, and the acquisition probability of the competent expert π_c, the principal updates her belief about the expert's competence, taking into account the message and the true state, as follows:

$$\begin{aligned} Pr(t_i = c|S = M) &= \frac{\lambda(\pi_c + \frac{1}{2}(1-\pi_c))}{\lambda(\pi_c + \frac{1}{2}(1-\pi_c)) + \frac{1}{2}(1-\lambda)} \\ Pr(t_i = c|S \neq M) &= \frac{\frac{1}{2}\lambda(1-\pi_c)}{\frac{1}{2}\lambda(1-\pi_c) + \frac{1}{2}(1-\lambda)} \end{aligned} \tag{A.8}$$

The equilibrium value π_c^*, that renders a competent expert indifferent between acquiring information or remaining uninformed is calculated as follows:

$$\begin{aligned} EU_c(\text{buy}) &= Pr(t_i = c|S = M) - C \\ &\overset{!}{=} \\ EU_c(\text{not buy}) &= \frac{1}{2}(Pr(t_i = c|S = M) + Pr(t_i = c|S \neq M)) \\ \pi_c^* &= \frac{\lambda + \sqrt{4C^2 + \lambda^2 - 2\lambda + 1} - 1}{2C\lambda} \end{aligned} \tag{A.9}$$

The range of c where the mixed strategy equilibrium holds, namely where $0 \leq \pi_c^* \leq 1$ is $0 \leq C \leq \frac{\lambda}{\lambda+1} = C'''$. Note that the highest cost-level where this equilibrium can be sustained equals the threshold of the pure strategy equilibrium where only competent experts acquire information with certainty (see equation A.4). The equilibrium probability that the correct decision is taken in the mixed strategy equilibrium equals the one of the most informative equilibrium for $C = 0$ (see A.1) and for $C > 0$ it is as follows:

$$\begin{aligned} &Pr(S = D|\pi_i = 0, \pi_c = \pi_c^*, IC) = \\ &\sum_{k=0}^{n} \binom{n}{k} \lambda^{n-k}(1-\lambda)^k (\sum_{i=0}^{n-k} \binom{n-k}{n-k-i} \pi_c^{*(n-k-i)}(1-\pi_c^*)^i \frac{\sum_{j=0}^{\frac{n}{2}-1} \binom{k+i}{k+i-j} + \frac{1}{2}\binom{k+i}{k+i-\frac{n}{2}}}{2^{k+i}}) \end{aligned} \tag{A.10}$$

for an even number of experts, and

$$\begin{aligned} &Pr(S = D|\pi_i = 0, \pi_c = \pi_c^*, IC) = \\ &\sum_{k=0}^{n} \binom{n}{k} \lambda^{n-k}(1-\lambda)^k (\sum_{i=0}^{n-k} \binom{n-k}{n-k-i} \pi_c^{*(n-k-i)}(1-\pi_c^*)^i \frac{\sum_{j=0}^{\frac{n-1}{2}} \binom{k+i}{k+i-j}}{2^{k+i}}) \end{aligned} \tag{A.11}$$

for an odd number of experts.

DG mixed-strategy equilibrium $(\hat{\pi}_i, \hat{\pi}_c) = (0, \pi_c)$**:** The (weakly) dominant strategies of DG to reveal the true state to the other expert in case one is informed and to truthfully reveal the lack of information for uninformed experts also holds in the mixed strategy equilibrium. The Bayesian updating of the principal given the true state and the group decision is:

$Pr(t_i = c|S = D) =$

$$\frac{\lambda(1-\frac{1}{2}(1-\pi_c)(\sum_{i=0}^{n-1}\binom{n-1}{n-1-i}\lambda^{(n-1-i)}(1-\lambda)^i(1-\pi_c)^{(n-1-i)}))}{\lambda(1-\frac{1}{2}(1-\pi_c)(\sum_{i=0}^{n-1}\binom{n-1}{n-1-i}\lambda^{(n-1-i)}(1-\lambda)^i(1-\pi_c)^{(n-1-i)}))+(1-\lambda)(1-\frac{1}{2}(\sum_{i=0}^{n-1}\binom{n-1}{n-1-i}\lambda^{(n-1-i)}(1-\lambda)^i(1-\pi_c)^{(n-1-i)}))}$$

in case of a correct group decision, and

$Pr(t_i = c|S \neq D) =$

$$\frac{\lambda(\frac{1}{2}(1-\pi_c)(\sum_{i=0}^{n-1}\binom{n-1}{n-1-i}\lambda^{(n-1-i)}(1-\lambda)^i(1-\pi_c)^{(n-1-i)}))}{\lambda(\frac{1}{2}(1-\pi_c)(\sum_{i=0}^{n-1}\binom{n-1}{n-1-i}\lambda^{(n-1-i)}(1-\lambda)^i(1-\pi_c)^{(n-1-i)}))+(1-\lambda)(\frac{1}{2}(\sum_{i=0}^{n-1}\binom{n-1}{n-1-i}\lambda^{(n-1-i)}(1-\lambda)^i(1-\pi_c)^{(n-1-i)}))}$$

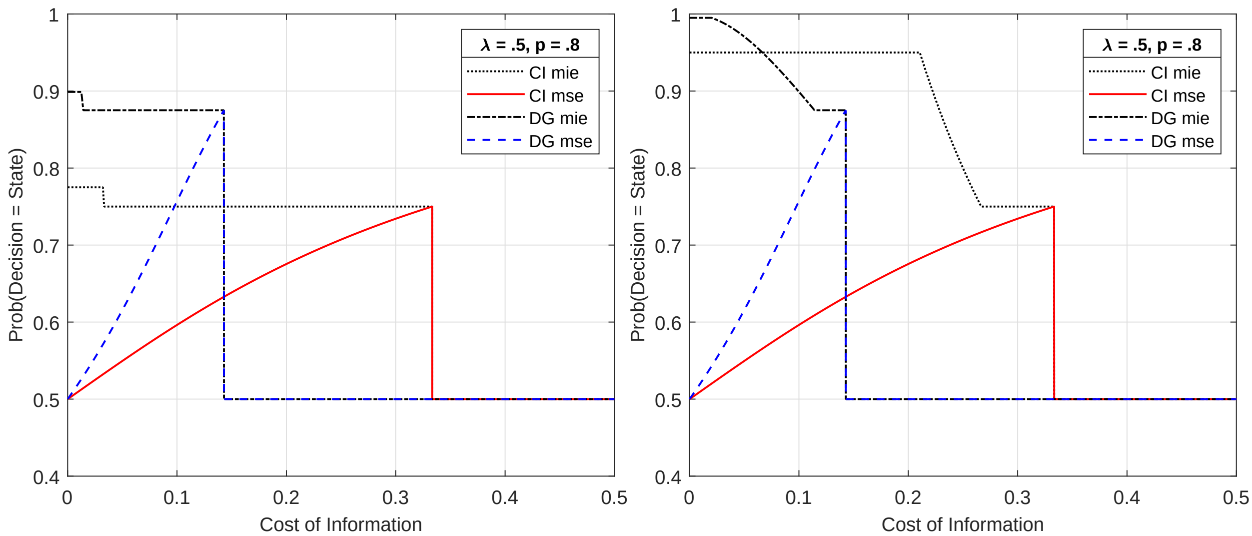
in case of a decision that does not equal the state of the world.

In equilibrium, the competent experts need to be indifferent between acquiring information or remaining uninformed. The equilibrium value of $\pi_c = \pi_c^*$ therefore solves the following equation: $EU_c(\text{buy}) = Pr(t_i = c|S = D) - C \stackrel{!}{=} Pr(t_i = c|S = D) + (\frac{1}{2}(\sum_{i=0}^{n-1}\binom{n-1}{n-1-i}\lambda^{(n-1-i)}(1-\lambda)^i(1-\pi_c)^{(n-1-i)})) \cdot (Pr(t_i = c|S \neq D) - Pr(t_i = c|S = D)) = EU_c(\text{not buy})$. In equilibrium, the probability of a correct decision in this mixed strategy equilibrium equals the one of the most informative equilibrium in case of $C = 0$ (see A.5) and for $C > 0$ it equals

$$Pr(S = D|\pi_i = 0, \pi_c = \pi_c^*, DG) = 1 - \frac{1}{2}\sum_{i=0}^{n}\binom{n}{n-i}\lambda^{(n-i)}(1-\lambda)^i(1-\pi_c^*)^{(n-i)}. \qquad \text{(A.12)}$$

The range where this equilibrium exists equals the range of the most-informative equilibrium: $C \leq \frac{\lambda(1-\lambda)^{n-1}}{2-(1-\lambda)^n} = C''$.

Figure A1 plots the mixed strategy equilibria for $n = 2$ experts and the same parameter values as used in Figure 1.



(a) $p = 0.1$, high difference in competence (b) $p = 0.8$, low difference in competence

Figure A1: Decision Accuracies of the Mixed-Strategy Equilibrium (mse) and the Most-Informative Equilibrium (mie) for $n = 2$ Experts.

In total, there are three different type-symmetric equilibria for $0 < C < \frac{\lambda}{\lambda+1}$ in CI and $0 < C < \frac{\lambda(1-\lambda)^{n-1}}{2-(1-\lambda)^n}$ in DG: 1) The babbling equilibrium where no information is acquired and no updating depending on the message or the decision takes place, 2) the mixed strategy equilibrium described in A3 where incompetent experts do not acquire information and competent experts are indifferent between acquiring and not acquiring information, and 3) the most-informative equilibrium described in A1 and A2, where competent experts acquire information with certainty. There are no additional type-symmetric equilibria that differ in the probability of information acquisition: As $p < 1$ by assumption, whenever the competent experts are at most indifferent between acquiring and not acquiring information, incompetent experts have the dominant strategy not to acquire information, and whenever incompetent experts are at least indifferent in whether or not to acquire information, competent experts have the dominant strategy to acquire information.

A4 Proof of Proposition 1

After characterizing the most-informative and the mixed-strategy equilibria for the whole range of C under CI (Sections A1 and A3) and DG (Sections A2 and A3), we are now ready to prove Proposition 1 under the assumption that subjects either play the most-informative equilibrium under both regimes or the mixed-strategy equilibrium under both regimes.

Proposition 1
For all numbers of experts $n \geq 2$, all prior probabilities of competence $\lambda \in (0,1)$ and all levels of incompetence $p \in (0,1)$, there always exist cost levels $C'(n,\lambda,p) < C''(n,\lambda,p) < C'''(n,\lambda,p)$, such that

1. *delegation to the group of experts leads to a higher decision accuracy than consulting the experts individually if $0 \leq C \leq C'$,*
2. *consulting the experts individually leads to a higher decision accuracy than delegation to the group of experts if $C'' < C \leq C'''$,*
3. *and both regimes lead to the same decision accuracy if $C''' < C$.*

Proof. **(1) DG outperforming CI if $0 \leq C \leq C'$:** In the most-informative equilibrium for low level of costs, both types of experts acquire information under CI as well as under DG. Equations A.1 and A.5 represent the decision accuracies for this type of equilibrium under CI and DG respectively. For all $n \geq 2$ and any λ and p, $Pr(D = S|\pi_i = \pi_c = 1, CI) < Pr(D = S|\pi_i = \pi_c = 1, DG)$. Further, equation A.6 represents the threshold costs C' up to which this equilibrium exists under DG. As $C' > 0$ for all $0 < \lambda < 1$, $0 < p < 1$ this equilibrium always exists. Thus, for $0 \leq C \leq C'$, DG always leads to a higher decision accuracy than CI.

In case the mixed strategies described in Section A3 are played under CI and DG, equations A.10, A.11 and A.12 show that the success probabiliy for a given C is higher for DG than for IC (for $C = 0$ the success probabilities equal the ones of the most informative equilibrium). As the mixed strategy equilibrium for DG is defined over the range $0 \leq C \leq C''$, the mixed strategy equilibrium for CI over the range $0 \leq C \leq C'''$, and $C'' > 0$ and $C'' < C'''$ (and $C' < C''$), DG always leads to a higher success probability than CI for $0 \leq C \leq C'$.

(2) CI outperforming DG if $C'' \leq C'''$: Equations A.4 and A.7 represent the cost thresholds up to where information is acquired. As the threshold under DG, $C'' = \frac{\lambda(1-\lambda)^{n-1}}{2-(1-\lambda)^n}$, is strictly lower than the threshold under CI, $C''' = \frac{\lambda}{\lambda+1}$, for all $\lambda < 1$ and $n \geq 2$, there always is a range of costs where information is acquired under CI but not under DG. The decision accuracy of the CI equilibrium where competent experts acquire information with certainty is shown in equation A.3 (or in equations A.10 and A.11 in case the mixed strategy equilibrium is played in both regimes), and we see that $Pr(D = S|\pi_i = 0, \pi_c = 1, CI) > 0.5 = Pr(D = S|\pi_i = \pi_c = 0, DG)$ (or for the mixed strategy equilibrium $Pr(D = S|\pi_i = 0, \pi_c = \pi_c^*, CI) > 0.5 = Pr(D = S|\pi_i = \pi_c = 0, DG)$) for all $n \geq 2$ and $0 < \lambda < 1$. Thus, for $C'' \leq C'''$, CI always leads to a higher decision accuracy than DG.

(3) Both regimes lead to the same decision accuracy if $C > C'''$: Above C''', no expert will buy a signal under either regime. Hence, the decision accuracy will be $\frac{1}{2}$ under either regime. □

B Further Experimental Results

Table B1: Random Treatment Allocation: Subject Characteristics across Treatments

Variables	Grp. Dec. $C = 0$	Prin. Dec. $C = 0$	$C = 10$	MG of 9 $C = 30$	MG of 18 $C = 30$	p-value
Age	22.47	22.13	22.33	22.62	23.31	0.54
	(4.23)	(2.64)	(2.27)	(3.91)	(3.60)	
Female	0.61	0.65	0.49	0.58	0.67	0.25
	(0.49)	(0.48)	(0.50)	(0.50)	(0.48)	
Money per Month	330.20	349.20	351.82	373.52	372.38	0.83
	(208.26)	(199.61)	(222.11)	(231.34)	(211.75)	
share Quiz correct	0.95	0.91	0.92	0.93	0.91	0.22
	(0.09)	(0.12)	(0.10)	(0.12)	(0.10)	
Math Grade in School	2.24	2.65	2.55	2.38	2.32	0.27
	(1.21)	(1.15)	(1.12)	(1.21)	(1.00)	
Born in Germany	0.88	0.86	0.92	0.97	0.89	0.18
	(0.33)	(0.35)	(0.28)	(0.17)	(0.32)	

Notes: Subjects' characteristics (means) in the different treatment conditions. Standard deviations are reported in parentheses. The p-value refers to the joint test of equality across all four groups. 'Share Quiz correct' corresponds to the share of correct answers in the on-screen comprehension quiz that subjects take after reading the instructions. All other variables come from the post-experimental questionnaire. 'Money per Month' is the answer to the question "How much money per month do you have left after you paid your rent and your health insurance?". We had to excluded one very unrealistic outlier. The Math Grades in German High Schools range from 1 (best) to 5 (worst).

Table B2: Information Acquisition, Incompetent Experts

	Cost = 0, Gr. Dec.		Cost = 0, Prin. Dec.		Cost = 10		Cost = 30	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Delegation	-0.026	-0.039	-0.043	-0.048	-0.092**	-0.076**	-0.017	-0.015
	(0.037)	(0.029)	(0.037)	(0.040)	(0.033)	(0.032)	(0.018)	(0.017)
const.	0.913***		0.930***		0.165***		0.028*	
	(0.034)		(0.032)		(0.041)		(0.012)	
Obs.	571	571	547	547	516	516	547	547
Clusters	8 MG	8 MG	8 MG	8 MG	8 MG	8 MG	8 MG	8 MG
Fixed Effects	NO	YES	NO	YES	NO	YES	NO	YES
(Adj.) R^2	0.002	0.507	0.006	0.608	0.020	0.449	0.004	0.114

Notes: OLS regressions of expert's buying decision as the dependent variable. Standard-errors (in parentheses) are clustered at the matching-group level. *Delegation* is a dummy for the DG rounds. Only decisions of incompetent experts are included. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Table B3: Information Acquisition, Competent Experts

	Cost = 0, Gr. Dec.		Cost = 0, Prin. Dec.		Cost = 10		Cost = 30	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Delegation	-0.004	-0.004	-0.004	-0.006	-0.020	-0.040	-0.103**	-0.084*
	(0.004)	(0.004)	(0.004)	(0.007)	(0.042)	(0.043)	(0.040)	(0.044)
const.	1***		1***		0.906***		0.698***	
	(0)		(0)		(0.028)		(0.080)	
Obs.	533	533	557	557	588	588	557	557
Clusters	8 MG	8 MG	8 MG	8 MG	8 MG	8 MG	8 MG	8 MG
Fixed Effects	NO	YES	NO	YES	NO	YES	NO	YES
(Adj.) R^2	0.002	0.078	0.002	0.103	0.001	0.549	0.012	0.586

Notes: OLS regressions of expert's buying decision as the dependent variable. Standard-errors (in parentheses) are clustered at the matching-group level. *Delegation* is a dummy for the DG rounds. Only decisions of competent experts are included. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Table B4: Information Acquisition, Incompetent Experts

	Cost = 0, Gr. Dec.		Cost = 0, Prin. Dec.		Cost = 10		Cost = 30	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Delegation	-0.028	-0.041	-0.048	-0.045	-0.092**	-0.077*	0.002	0.005
	(0.041)	(0.036)	(0.036)	(0.041)	(0.036)	(0.037)	(0.023)	(0.026)
Endogenous	-0.019	-0.022	-0.017	0.0022	-0.086	-0.075	0.017	0.000
	(0.046)	(0.051)	(0.065)	(0.029)	(0.069)	(0.090)	(0.019)	(0.021)
Delegation	0.090	0.097	0.069	-0.005	-0.019	-0.010	-0.030	-0.018
$\times$*Endogenous*	(0.055)	(0.105)	(0.064)	(0.032)	(0.042)	(0.127)	(0.034)	(0.032)
Period	0.009	0.009	0.005	0.005	0.004	0.003	-0.004	-0.004
	(0.005)	(0.006)	(0.006)	(0.004)	(0.005)	(0.004)	(0.003)	(0.003)
const.	0.857***		0.899***		0.154***		0.055**	
	(0.051)		(0.047)		(0.036)		(0.023)	
Obs.	571	571	547	547	516	516	831	831
Clusters	8 MG	8 MG	8 MG	8 MG	8 MG	8 MG	10 MG	10 MG
Fixed Effects	NO	YES	NO	YES	NO	YES	NO	YES
(Adj.) R^2	0.015	0.519	0.012	0.610	0.025	0.452	0.005	0.264

Notes: OLS regressions of expert's buying decision as the dependent variable. Standard-errors (in parentheses) are clustered at the matching-group level. *Delegation* is a dummy for the DG rounds. *Endogenous* is a dummy for the rounds with endogenous regime (rounds 21-23). Only decisions of incompetent experts are included. *Period* is adjusted for order effects and counts the number of times the same regime (CI or DG) is played by an expert. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Table B5: Information Acquisition, Competent Experts

	Cost = 0, Gr. Dec.		Cost = 0, Prin. Dec.		Cost = 10		Cost = 30	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Delegation	-0.005	-0.005	-0.005	-0.006	-0.026	-0.038	-0.112**	-0.116**
	(0.005)	(0.005)	(0.005)	(0.006)	(0.045)	(0.043)	(0.035)	(0.036)
Endogenous	-0.004	-0.003	-0.004	0.003	0.002	0.020	0.021	-0.002
	(0.004)	(0.004)	(0.004)	(0.003)	(0.033)	(0.030)	(0.067)	(0.053)
Delegation	0.005	0.003	0.005	-0.002	0.039	-0.011	-0.132	-0.001
$\times$*Endogenous*	(0.005)	(0.004)	(0.005)	(0.002)	(0.068)	(0.018)	(0.096)	(0.069)
Period	0.001	0.001	0.001	0.001	-0.004	-0.001	-0.020***	-0.019***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.004)	(0.004)	(0.006)	(0.004)
const.	0.997***		0.996***		0.931***		0.821***	
	(0.003)		(0.004)		(0.032)		(0.064)	
Obs.	533	533	557	557	588	588	825	835
Clusters	8 MG	8 MG	8 MG	8 MG	8 MG	8 MG	10 MG	10 MG
Fixed Effects	NO	YES	NO	YES	NO	YES	NO	YES
(Adj.) R^2	-0.003	-0.019	-0.003	0.015	-0.004	0.507	0.032	0.478

Notes: OLS regressions of expert's buying decision as the dependent variable. Standard-errors (in parentheses) are clustered at the matching-group level. *Delegation* is a dummy for the DG rounds. *Endogenous* is a dummy for the rounds with endogenous regime (rounds 21-23). Only decisions of competent experts are included. *Period* is adjusted for order effects and counts the number of times the same regime (CI or DG) is played by an expert. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Table B6: Communication of Experts

	'No-Info' Message				*false* Message	
	Uninformed Experts		Informed Experts		Informed Experts	
	(1)	(2)	(3)	(4)	(5)	(6)
Delegation	0.366***	0.369***	0.004	0.004	0.004	0.005
	(0.036)	(0.037)	(0.004)	(0.004)	(0.003)	(0.004)
Endogenous	-0.013	-0.007	-0.004*	-0.004	-0.005	-0.001
	(0.039)	(0.040)	(0.002)	(0.003)	(0.003)	(0.003)
Delegation	0.044	0.043	-0.004	0.000	-0.004	-0.004
$\times$*Endogenous*	(0.067)	(0.054)	(0.004)	(0.003)	(0.003)	(0.004)
Period	-0.016***	-0.017***	0.000	0.000	0.001	0.001
	(0.003)	(0.004)	(0.000)	(0.000)	(0.001)	(0.000)
const.	0.482***		-0.001		-0.004	
	(0.028)		(0.003)		(0.003)	
Obs.	2202	2202	1662	1662	1662	1662
Clusters	26 MG	26 MG	26 MG	26 MG	26 MG	26 MG
Fixed Effects	NO	YES	NO	YES	NO	YES
(Adj.) R^2	0.155	0.465	-0.000	0.079	0.002	0.110

Notes: Columns (1)-(4): OLS regressions with the $[0, 1]$-indicator variable for the message *"I do not have information"* as the dependent variable. Columns (5)-(6): OLS regressions with the $[0, 1]$-indicator variable for a wrong message (*blue* if the state of the world is *red* and vice versa) as the dependent variable. Standard-errors (in parentheses) are clustered at the matching-group level. *Delegation* is a dummy for the DG rounds, in which the message is sent to the other expert instead of to the principal. The data of the treatment with experts' decision power under DG is excluded. *Endogenous* is a dummy for the rounds with endogenous regime (rounds 21-23). *Period* is adjusted for order effects and counts the number of times the same regime (CI or DG) is played by an expert. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Table B7: Honest Revelations of Ignorance and Large Matching Groups

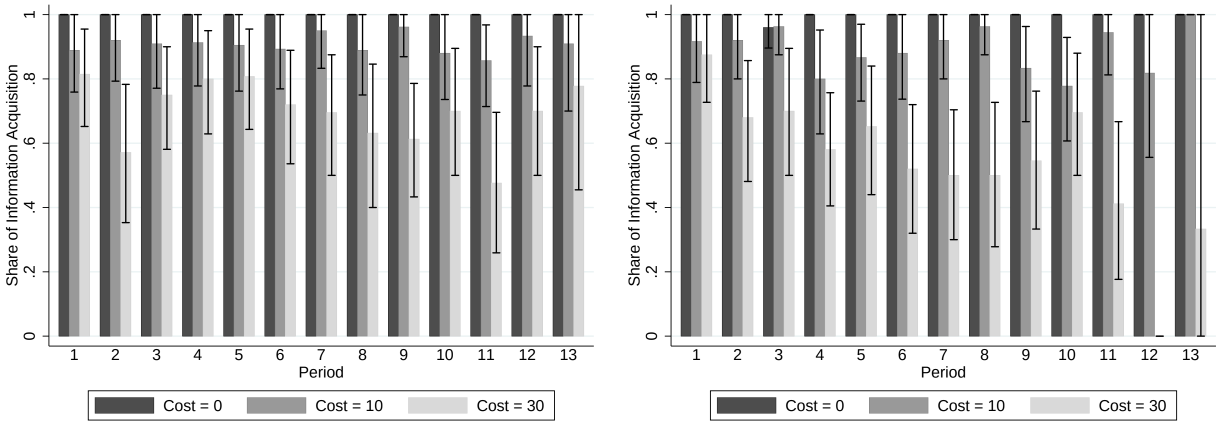
	(1)	(2)	(3)
Competent	-0.257***	-0.257***	-0.2567***
	(0.031)	(0.049)	(0.032)
Delegation	0.342***	0.342***	0.342***
	(0.034)	(0.056)	(0.065)
Large Matching Groups	0.002	0.002	0.002
	(0.041)	(0.074)	(0.055)
Large Matching Groups	0.029	0.029	0.029
× *Delegation*	(0.058)	(0.102)	(0.158)
constant	0.408***	0.408***	0.408***
	(0.025)	(0.048)	(0.049)
Observations	1119	1119	1119
N clusters	-	72 Subj.	10 MG
R^2	0.165	0.165	0.165

Notes: OLS regressions with the $[0, 1]$-indicator variable for the message *"I do not have information"* as the dependent variable. Informed experts are not included in the regression. Standard-errors are reported in parentheses. *Delegation* is a dummy for the DG rounds, in which the message is sent to the other expert instead of to the principal. *Large Matching Groups* consist of 18 subjects (12 experts), the other matching groups consist of 9 subjects (6 experts). * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Table B8: Decision Accuracy

	Cost = 0, Gr. Dec.		Cost = 0, Prin. Dec.		Cost = 10		Cost = 30	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Delegation	0.088**		0.087***		0.064*		0.059***	
	(0.043)		(0.019)		(0.032)		(0.020)	
0 comp. Exp.		0.494***		0.452***		0.438***		0.507***
		(0.042)		(0.052)		(0.048)		(0.068)
1 comp. Exp.		0.867***		0.873***		0.857***		0.683***
		(0.032)		(0.028)		(0.022)		(0.051)
2 comp. Exp.		1		1		0.965***		0.885***
		(.)		(.)		(0.022)		(0.044)
0 comp. Exp.×DG		0.083		0.273***		-0.002		0.031
		(0.108)		(0.055)		(0.075)		(0.079)
1 comp. Exp.×DG		0.133***		0.069**		0.083**		0.103*
		(0.032)		(0.029)		(0.033)		(0.056)
2 comp. Exp.×DG		0		-0.060*		0.009		0.020
		(.)		(0.036)		(0.027)		(0.029)
const.	0.796***		0.799***		0.782***		0.694***	
	(0.026)		(0.022)		(0.012)		(0.029)	
Obs.	552	552	552	552	552	552	552	552
Clusters	8 MG	8 MG	8 MG	8 MG	8 MG	8 MG	8 MG	8 MG
(Adj.) R^2	0.012	0.883	0.0143	0.876	0.005	0.867	0.003	0.746

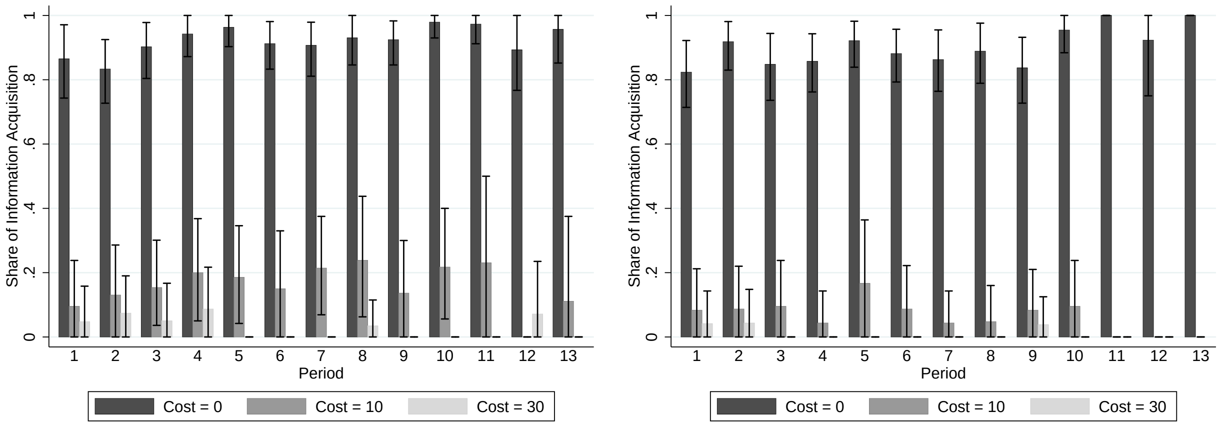
Notes: OLS regressions with a $[0, 1]$-indicator variable for a correct decision as the dependent variable. *Delegation* is a dummy for the DG rounds. Standard errors (in parentheses) are clustered at the matching group level and bootstrapped with 10,000 repetitions. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.



(a) Consulting Individually (b) Delegation to Group

Figure B1: Shares of Information Acquisition choices of competent experts over time.

Notes: Period i denotes the ith in which the same regime (CI or DG) is being played by the same subject. Periods 1-10 are always exogenous but correspond, dependent on the order of regimes, to either periods 1-10 or periods 11-20 in the experiment. Periods 11-13 in the figure are endogenous and correspond to period 21-23 in the experiment, dependent on how often the particular regime has been played for the individual so far. Whiskers represent 95% confidence intervals based on bootstrapped standard-errors (10,000 repetitions).



(a) Consulting Individually (b) Delegation to Group

Figure B2: Shares of Information Acquisition choices of incompetent experts over time.

Notes: Period i denotes the ith in which the same regime (CI or DG) is being played by the same subject. Periods 1-10 are always exogenous but correspond, dependent on the order of regimes, to either periods 1-10 or periods 11-20 in the experiment. Periods 11-13 in the figure are endogenous and correspond to period 21-23 in the experiment, dependent on how often the particular regime has been played for the individual so far. Whiskers represent 95% confidence intervals based on bootstrapped standard-errors (10,000 repetitions).

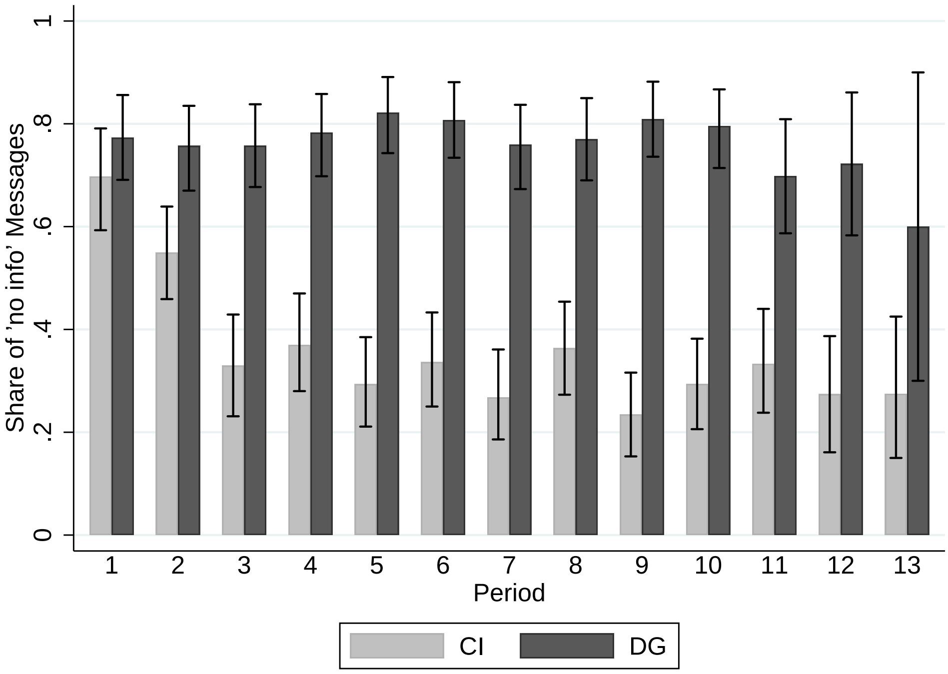


Figure B3: Shares of uninformed experts sending message 'I do not have any information' over time.

Notes: Period i denotes the ith in which the same regime (CI or DG) is being played by the same subject. Periods 1-10 are always exogenous but correspond, dependent on the order of regimes, to either periods 1-10 or periods 11-20 in the experiment. Periods 11-13 in the figure are endogenous and correspond to period 21-23 in the experiment, dependent on how often the particular regime has been played for the individual so far. Whiskers represent 95% confidence intervals based on bootstrapped standard-errors (10,000 repetitions).

C Decision Screens

Translations of the German texts (from top to bottom of each screen) are provided in the figure notes.

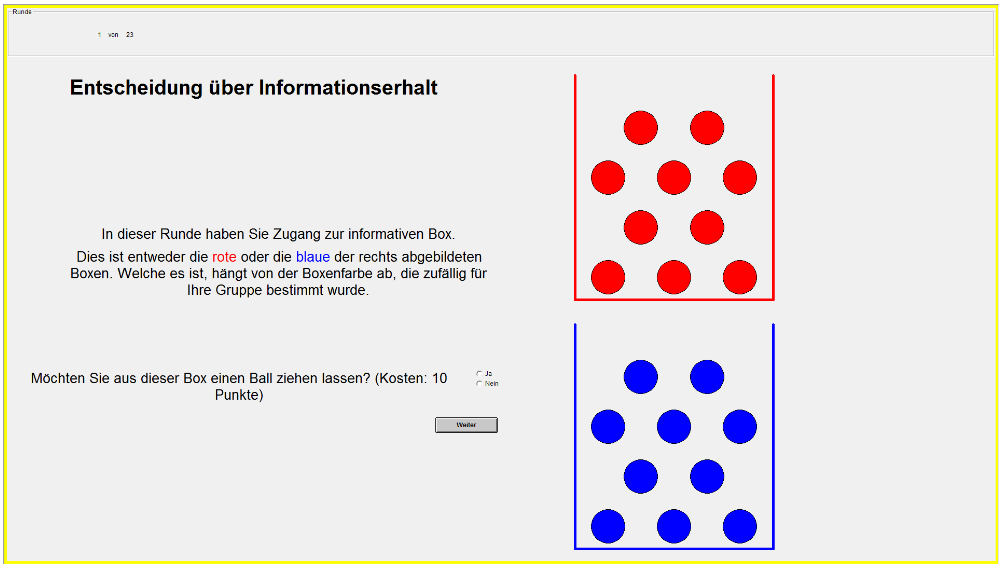


Figure C1: Decision Screen. $C = 10$, CI and DG, Competent Expert.

Notes: "Decision on information receipt. In this round you have access to the informative box. This is either the red or the blue box shown on the right. Which one it is depends on the color of the box that was randomly determined for your group. Do you want to draw a ball out of this box? (Cost: 10 Points). Yes/No." (Different cost treatments accordingly.)

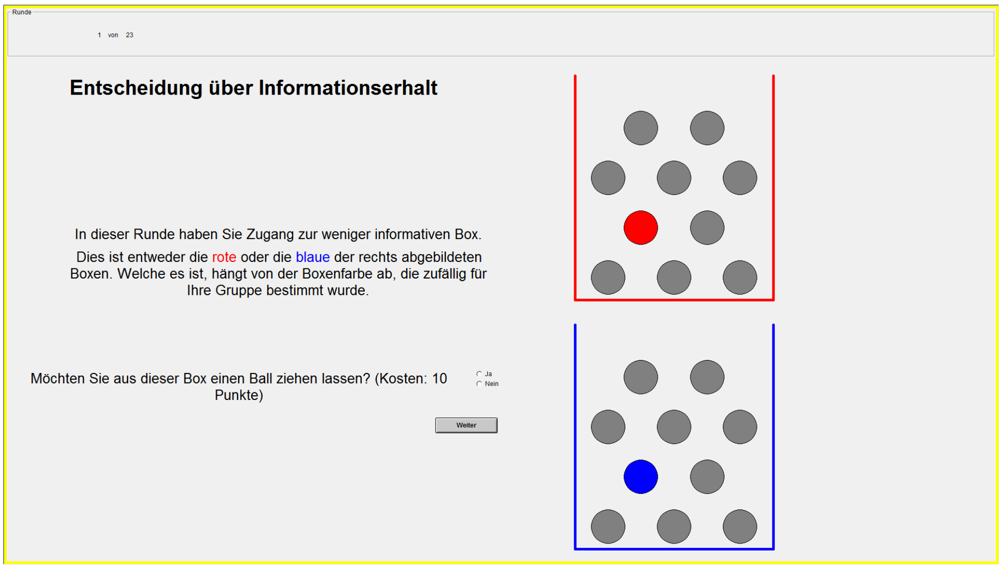


Figure C2: Decision Screen. $C = 10$, CI and DG, Incompetent Expert.

Notes: "Decision on information receipt. In this round you have access to the less informative box. This is either the red or the blue box shown on the right. Which one it is depends on the color of the box that was randomly determined for your group. Do you want to draw a ball out of this box? (Cost: 10 Points). Yes/No." (Different cost treatments accordingly.)

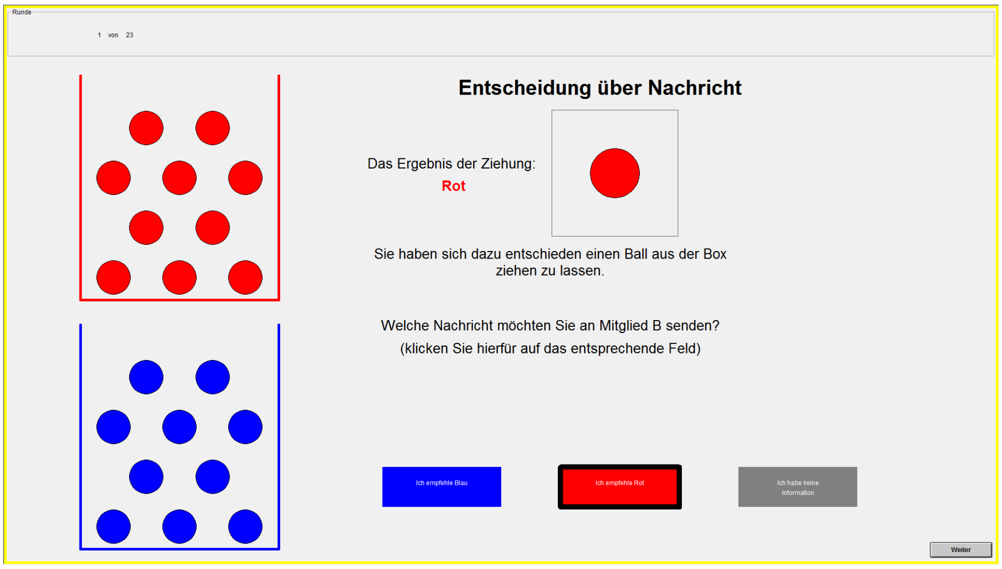


Figure C3: Decision Screen. CI, Competent Expert.

Notes: "Decision on message. The result of the draw: Red. You decided to draw a ball from the box. Which message do you want to send to Member B? (click on the respective field) I recommend Blue / I recommend Red / I do not have any information." (in the DG treatment *Member B* is replaced by *the other Member A of your group*.)

Figure C4: Decision Screen. CI, Principal.

Notes: "Decision on color of the box of the group. Member A1 sent: I recommend blue. Member A2 sent: I do not have any information. What color do you decide for? Red / Blue."

Figure C5: Decision Screen. DG, Expert.

Notes: "Poll on group decision. The other Member A of your group sent the following to you: I recommend Red. You sent to the other Member A the following: I do not have any information. You and the other Member A can vote on the group decision. Member B and the observer are only informed about the group decision. What do you vote for? Red / Blue."

Figure C6: Decision Screen. CI, Principal / Observer.

Notes: "Probability assessment for the other group. The color of the box of the other group was blue in this round. Member A1 of the other group sent the following message: I recommend Blue. Member A2 of the other group sent the following message: I do not have any information. Enter the probability with which you think that Member A1(A2) had access to the informative box in per cent (a number between 0 and 100)."

Figure C7: Decision Screen. DG, Principal / Observer.

Notes: "Probability assessment for the other group. The color of the box of the other group was blue in this round. The decision of the Member As of the other group was blue. Enter your assessment with respect to the randomly determined Member A of the other group. Enter the probability with which you think that the randomly determined member A of the other group had access to the informative box in per cent (a number between 0 and 100)."