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## Decision Initiation, Decision Implementation, and the Allocation of Decision Rights

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## Abstract

Organizations must not only take the right decisions, they must also ensure that these decisions are effectively implemented. Fama & Jensen (1983) argue that the same members of many organization are often responsible for both decision initiation and implementation. If these have social preferences, they might thus sabotage both project choices and implementation to express their discontent with the allocation of decision rights. How decisions come about also affects implementation if workers have reciprocal fairness concerns. Our experimental evidence demonstrates that the possibility to sabotage implementation leads to more delegation, but only if workers have high costs of obstructing informed decisions. We further find that the allocation of authority as such affects implementation.

JEL-Code: C910, D230, D860, L200.

Keywords: delegation, implementation, procedural preferences, reciprocity.

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# 1 Introduction

Making the right strategic decisions and ensuring their subsequent efficient implementation are crucial preconditions for organizational success. Jensen & Meckling (1995) and Aghion & Tirole (1997) emphasize that the allocation of decision rights can influence the quality of organizational choices. They argue that delegation promotes the gathering and use of decentralized specific information. But delegation also leads to a loss of control since decisions need not longer be taken in the best interest of the organization. The optimal allocation of authority balances these countervailing effects.<sup>1</sup> Recent experiments by Fehr, Herz & Wilkening (2013) and Dominguez-Martinez, Sloof & von Siemens (2014) largely confirm – despite some behavioral peculiarities – the predicted interplay between the allocation of decision rights, the interest alignment within the organization, the gathering of information, and ultimately the efficiency of organizational choices.

But organizations must not only take the right decisions, they must also ensure that these decisions are effectively implemented. Several experiments suggest that organizations might benefit from delegating unpopular decisions to avoid the attribution of negative outcomes. Delegation then serves to improve implementation, rather than to promote the gathering and use of information. Blount (1995) documents that unfair bargaining offers are more acceptable if made by uninterested parties or randomization devices. Fershtman & Gneezy (2001) show that principals can improve their bargaining outcome via delegation, although principals openly use monetary incentives to induce their delegates to make unfair bargaining offers. Coffman (2011) documents that principals can use delegation to reduce attracted punishment by unaffected third parties, even if principals essentially force their delegates to make unfair allocation decisions. Bartling & Fischbacher (2012) find that delegation of nasty decisions reduces punishment by affected participants, although participants understand that principals delegate to avoid punishment. Aldashev, Kirchsteiger & Sebald (2010) show that using a public randomization device to assign an unpleasant work task improves performance.<sup>2</sup> The empirical evidence therefore clearly suggests that the allocation of authority influences

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<sup>1</sup>The allocation of decision rights is one of the pillars of organizational architecture, see for example Brickley, Zimmerman & Smith (2004). An extensive theoretical literature explores the optimal allocation of authority. For excellent surveys see Bolton & Dewatripont (2013) and Gibbons, Matouschek & Roberts (2013).

<sup>2</sup>Hamman, Loewenstein & Weber (2010) focus not so much on whether principals delegate unpopular decisions to avoid retaliation, but rather whether they find delegates willing to implement unpopular or immoral decisions. See also Falk & Kosfeld (2006), Schnedler & Vadovic (2011), Charness, Cobo Reyes, Jiménez, Lacomba & Lagos (2012), and Brandts, Güth & Stiehler (2006) on the link between delegation and cooperation.

both the quality of organizational choices and their implementation.<sup>3</sup> Interestingly, Fama & Jensen (1983) point out that the same members of the organization are often responsible for both gathering decision-relevant information and for the subsequent implementation of organizational decisions. This bundling of what they call *decision initiation* and *decision implementation* into *decision management* is presumably optimal, because the same people often have the specific information important for both making the right decisions and their effective implementation. For the same reason, the delegation of unpopular decisions to outsiders (or randomization devices) might be impossible without compromising the quality of organizational choices. However, all existing experimental studies focus on either the link between delegation and organizational choices or on the link between delegation and implementation.

With this laboratory experiment, we complement the existing literature by studying how delegation affects organizational outcomes if members of the organization carry out the double role of decision initiation and decision implementation. With our experimental design we can investigate whether delegation improves implementation even if prior organizational decisions are not affected. This isolates the link between delegation and implementation as documented in the existing literature. However, we can also explore how the possibility to obstruct both the gathering of information and implementation interact to shape the chosen allocation of authority. In particular, we can study conditions under which the possibility to sabotage decisions might render sabotage of implementation irrelevant. This sheds light on the boundaries within which the results from the experimental literature on delegation and implementation are relevant for organizations in which decision initiation and implementation are in the same hands.<sup>4</sup>

Our experimental design captures the idea that the allocation of decision rights affects implementation because some members of the organization have social preferences. Members of the organization with outcome-based social preferences as in Fehr & Schmidt (1999) and

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<sup>3</sup>The literature from organizational behavior also suggests that the allocation of authority affects workplace behavior. For example, Bennet (1998) and Ambrose, Seabright & Schminke (2002) find that workers who perceive little control over their work environment are significantly more likely to engage in deviant workplace behavior and sabotage. Deviant workplace behavior includes not only absenteeism, neglecting instructions, and shirking, but also extremely dysfunctional behavior like stealing or behaving rudely.

<sup>4</sup>Camerer & Weber (2013) argue that experiments on organizational economics should try to match the situation of interests without compromising control. Our experimental design thus provides an additional step towards the experimental investigation of the delegation of decision rights in organizations.

Bolton & Ockenfels (2000) might sabotage decision implementation to reduce unfavorable payoff inequality. Members of the organization with reciprocal preferences might obstruct efficient implementation if they consider the behavior of those with decision authority as unkind or unfair.<sup>5</sup> First, managers might use their authority to make decisions that further only their own interests. Those suffering from the disadvantageous outcomes then consider the ruthless exploitation of power as unkind. How decision authority is employed is then crucial. Second, keeping authority as such might be considered an unkind organizational choice, because it deprives others of decision autonomy. How decision authority is employed is then only secondary. Frey, Benz & Stutzer (2004) indeed argue that some people enjoy decision autonomy, and Benz & Frey (2008), Fuchs-Schündeln (2009), Bartling, Fehr & Herz (2013), and Owens, Grossman & Fackler (2014) provide empirical evidence for such preferences for decision autonomy. To isolate the importance of social preferences – no matter whether distributional or reciprocal concerns – for the allocation of authority, we conduct an experiment in which potential implementation problems never occur and are thus irrelevant if subjects are selfish in the sense that they maximize their own monetary payoffs.

In our experiment, we consider firms consisting of one manager and one worker. Firms have to implement one out of three projects. One of these projects is best for managers, one is best for workers, and one is bad for both managers and workers. It is initially unknown which project has which payoff consequences. The strategic interaction between managers and workers is based on Aghion & Tirole (1997). Managers thus first decide whether to delegate authority to their workers. Workers subsequently decide whether to gather costly information. If they gather information, both they and their managers always learn which project is best for the managers. The payoffs of the other projects become known with a probability of only 50%. Otherwise, no additional information is obtained. The organizational members with decision rights finally select one project for implementation.

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<sup>5</sup>Numerous experiments like Offerman (2002), Falk, Fehr & Fischbacher (2008), Charness (2004), and Maximiano, Sloof & Sonnemans (2013) provide empirical evidence on the importance of reciprocity. Rabin (1993), Levine (1998), Dufwenberg & Kirchsteiger (2004), Sliwka (2007), and Ellingsen & Johannesson (2008) outline some general theoretical models of reciprocity. Aldashev et al. (2010) and Sebald (2010) show theoretically in the framework of intention-based reciprocity how the delegation of decision rights to an explicit randomization device can reduce attribution and thus unkind reciprocal reactions.

To analyze the impact of potential implementation problems caused by social preferences, we compare the above baseline situation with a strategic situation in which workers explicitly decide how well to implement any decisions. In an additional fourth stage, workers exert costly effort from 0 to 10 to implement the selected project. We envision situations in which firms provide workers with monetary incentives to efficiently implement project choices. Thus, the more effort workers exert, the larger are the payoffs for both managers and workers. But due to agency issues, the incentive strength is limited, so that workers with social preferences can obstruct implementation at low personal costs. By the chosen parameters, adding the implementation stage yields the same project payoffs as in the baseline situation if workers exert full effort. Adding the implementation stage is therefore strategically irrelevant if workers maximize their own monetary payoffs. But if workers have social preferences, they might sabotage implementation. This affects the project choices of managers with authority. Since managers might no longer use their authority to implement their preferred outcome – because worker then obstruct implementation – the potential obstruction of implementation influences the allocation of decision rights and ultimately project choices.

Workers might also refuse to gather information and thus sabotage project choices. The importance of the possibility to obstruct implementation thus depends on the costs of bad project decisions for workers. This interaction between decision initiation and decision implementation lies at the heart of our study. We thus vary how bad the bad project is for workers. We expect that potential obstruction of implementation has a bigger impact on organizational outcomes if sabotaging project choices is prohibitively expensive for workers.

Finally, our informational structure allows us to compare the effort levels implementing the *same* project chosen under *different* decision procedures. If workers gather information, they might only learn which project is potentially best for the managers. Workers with decision power are then better off choosing this project rather than one of the other two projects in the dark, since in the latter case they risk ending up with the project that is bad for everybody. Managers with authority are of course likely to choose the projects that potentially yield them the most. We can thus compare workers' effort to implement a particular project – the project *best for managers* – when workers have chosen this project themselves, with the situation in which their managers have made the project choice.

The main results are as follows. The possibility to obstruct implementation increases the incidence of delegation from 39% to 72% in case bad project choices strongly hurt workers. But delegation increases only from 64% to 70% and thus much less in case the right project choices are not that crucial for workers. The data confirm that the possibility to obstruct implementation increases the level of delegation. This is consistent with the results from the experimental literature according to which delegation improves the acceptance of unpopular decisions. But qualifying the existing literature, we find that the effect of delegation on implementation is relevant only if obstructing project choices is prohibitively expensive for workers.

Looking at behavior more closely, we find that the delegation of authority becomes more prevalent for several reasons. Workers purposefully obstruct implementation of unwanted projects: they implement the project best for managers with an average effort ranging from 8.16 to 8.74, whereas they implement the other projects with a significantly higher average effort ranging from 9.58 to 9.82. Fully informed managers – with information on all projects – are less likely to choose the project best for them under full implementation in case workers can obstruct project implementation. The average percentages with which their preferred project is then chosen drop from 99% to 71% if the decision is important for workers, and from 89% to 73% if project choices are less crucial for workers. Workers with authority almost always gather information. However, workers sabotage information gathering in case managers keep authority. The decrease in information gathering is very large from 96% to around 31% if bad project choices do not hurt workers too much. The decrease in information gathering is still substantial from around 99% to around 75% even if this really hurts the workers themselves.

We further find that workers also respond in their implementation effort to the way in which project decisions have come about. In particular, they implement the project potentially best for managers under full implementation with an average implementation effort ranging from only 4.98 to 6.30 if fully informed managers have made the project choice. In that case the managers could have chosen the workers' most preferred project, because payoff information on all the projects had been publicly known. Workers implement the same project with a higher average implementation effort ranging from 8.90 to 9.10 if workers have made the project choice themselves due to their limited information. This supports the existence of reciprocity concerns and suggests that – as argued by the existing literature on

delegation – that how a decision has come about can strongly impact on how this decision is accepted. Yet in contrast to the idea that members of the organization dislike the withdrawal of decision autonomy as such, our data suggests that they sabotage implementation only if their managers abuse authority to further their own interests.

## 2 Strategic Situation and Experimental Design

We consider a simple version of Aghion & Tirole (1997). Firms consists of one manager and one worker. Firms essentially select projects with initially unknown characteristics and subsequently ensure implementation. Workers crucially have the double role of collecting information to facilitate the right project choice, while at the same time they are responsible for project implementation. The strategic interaction between managers and workers can be summarized as follows:

1. The manager decides whether or not to delegate formal authority to the worker.
2. The worker observes the delegation decision of the manager.
3. The worker then decides on whether or not to gather costly information.
4. Information conditional on the worker's information gathering is revealed.
5. The organizational member with formal authority picks a project for implementation.
6. The characteristics of the chosen project are revealed (or already known).
7. The worker chooses the implementation effort and payoffs are realized.

We next fill in all the details. In all firms, one out of three investment projects (A,B,C) must be chosen for implementation. There are three types of projects. Projects “Manager-High” yield a high payoff to managers and an intermediate payoff to workers, “Worker-High” yield an intermediate payoff to managers and a high payoff to workers, and “Both-Low” yield low payoffs for both managers and workers. Managers and workers know that the projects yield these payoff combinations. But initially they do not know, which of the projects (A,B,C) is connected to which payoff combination.<sup>6</sup>

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<sup>6</sup>The initial situation is essentially like choosing one out of three facedown cards. Everybody knows the deck of cards: one card Manager-High, one card Worker-High, and one card Both-Low. But nobody knows which facedown card is which. Note that because the total deck of cards is known, flipping over one card does not only reveal information on this card, but also on the remaining two facedown cards.

Managers initially hold formal authority. We assume that formal authority can be delegated. Managers thus first decide whether or not to delegate formal authority to workers. Workers observe their managers' delegation choices and then decide whether or not to gather costly information. If workers do not gather information, no information on the projects is revealed. If workers gather information, both managers and workers always learn which of the projects (A,B,C) is project Manager-High. Whether they get additional information on the other two projects depends on chance. With some positive probability also the payoffs of the two other projects become publicly known. With the complementary probability no additional information is obtained. Finally, the party with decision authority chooses which project (A,B,C) to implement. After projects have been chosen, their characteristics become commonly known, irrespectively of workers' information gathering choices. Workers in the end exert effort to implement the selected project, and payoffs are realized.

The payoffs for both workers and managers are increasing in the implementation effort of workers. This corresponds to the typical organizational situations in which managers provide workers with monetary incentives to properly implement all projects. But following the large literature on moral hazard and agency costs, we assume that providing workers with very strong monetary incentives is either not possible or prohibitively expensive. Workers can consequently game the system and divert implementation effort to hurt managers at relatively low personal costs. Basically, workers can find cheap ways to seriously thwart the implementation of any project, so that managers' payoffs are more sensitive to the worker's effort than the worker's own payoffs. This provides some room for social preferences to be behaviorally relevant.

Complementing the literature on delegation and implementation, we use our experimental design to study whether workers do not only care for what decisions are taken, but also for how decisions come about. Our new design trick is the information manipulation. Gathering information does not always reveal information on all projects. Given the right parameters, partially informed workers find it in their own best interest to choose the known project Manager-High for implementation. The reason is that choosing one of the other two unknown projects risks getting project Both-Low. To identify procedural or reciprocal preferences, we can thus investigate whether workers implement the same project - the project Manager-High - differently depending on whether they or managers have made the project choice.

## 2.1 Treatment Variations and Parameter Choices

We want to study the impact of delegation on organizational outcomes if workers with social preferences have the double role of decision initiation and implementation, and thus the possibility to obstruct both information gathering and implementation. We therefore vary experimentally the relevance of these two channels to gain insights into the interaction of decision initiation and implementation.

First, we vary whether or not there is an implementation stage and thus the possibility to obstruct implementation. Workers choose an effort  $e \in \{0, 1, \dots, 10\}$  in our treatments with implementation. Workers cannot choose their implementation effort in our treatments with no implementation: their effort is then exogenously set to 10, while we do not mention implementation at all in the instructions. Second, we vary the costs for workers to sabotage information gathering. One possibility would have been to enforce information gathering by workers. To make the strategic situation more interesting, we instead vary the costs for workers to sabotage information generation. This allows us to explore whether withholding implementation effort still plays a prominent role if not gathering information provides an effective instrument to discipline managers. Summarizing, we vary whether or not there is an implementation stage, and whether or not making informed decisions is important for workers. This leaves us with four treatments.

The following parameters are constant across treatments. Gathering information reduces the payoff of workers by 5 points. After gathering information, managers and workers learn all project payoffs with probability 0.5, while with probability 0.5 only project Manager-High is revealed. Final project payoffs are the same in our treatments with and without implementation if workers choose maximum effort. Parameters are also set so that workers maximize their monetary payoffs by gathering information. Our design therefore ensures that the strategic situation is essentially equivalent in all four treatments if workers maximize their own expected payoffs. This highlights the effect of delegation on organizational outcomes in the presence of social preferences of workers. We summarize the payoff parameters of the experiment in Table 1.

## 2.2 Experimental Details

The experiment was programmed using the z-tree programming package by Fischbacher (2007). After reading paper instructions, subjects answered computerized control questions

Table 1: Payoff Combinations in Treatments

	Projects		
	Manager-High	Worker-High	Both-Low
No Implementation & Decision Important			
Manager Gets	90	80	10
Worker gets	70	100	-50
Implementation & Decision Important			
Manager Gets	$40 + 5e$	$30 + 5e$	$e$
Worker gets	$60 + e$	$90 + e$	$-60 + e$
No Implementation & Decision Unimportant			
Manager Gets	90	80	10
Worker gets	70	100	10
Implementation & Decision Unimportant			
Manager Gets	$40 + 5e$	$30 + 5e$	$e$
Worker gets	$60 + e$	$90 + e$	$e$

Payoff combinations for manager and worker given projects Manager-High, Worker-High, and Both-Low in our four treatments. Workers choose effort  $e \in \{0, 1, \dots, 10\}$  if there is an implementation stage. Payoffs are in these cases net of effort costs.

to verify their understanding. Subsequently they learned their role (manager or worker). Roles were kept fixed during the experiment. We framed the strategic situation as described in the main text (see the appendix for sample instructions). Subjects were thus explicitly labelled either manager or worker, managers decided whether or not to delegate decision authority, et cetera. The experiment consisted of 20 periods. In each period subjects were paired in couples of one manager and one worker. We employed a stranger design with at least two independent matching groups per session.

For each treatment we ran three sessions with 14 to 26 participants. In total 272 subjects participated. Subjects were mostly undergraduates from the University of Amsterdam. Due

Table 2: Experimental Details

	Sessions	Matching Groups	Subjects
No Implementation & Decision Important	3	6	56
Implementation & Decision Important	4	8	74
No Implementation & Decision Unimportant	3	7	62
Implementation & Decision Unimportant	3	7	70

Matching groups varied in size between 8 to 12 subjects.

to variation in show up, matching groups contained between 8 and 12 subjects.<sup>7</sup> All tables show the averages of the matching group averages. Our statistical analysis is based on the comparison of the distribution of matching group averages. Overall earnings equalled the sum of the earnings in the 20 periods. The conversion rate was 1 eurocent per point earned. At the end of experiment, subjects filled out a questionnaire which is available upon request. They earned on average 18 euros from the experiment for about 80 minutes.<sup>8</sup>

### 3 Behavioral Predictions

In this section we develop behavioral predictions. We first consider the case in which subjects maximize their own expected monetary payoffs. We then proceed to analyze the impact of social preferences. We there focus first on predictions based on general social preferences, and then move on to the more specific predictions arising from preferences for decision autonomy and reciprocity. We are primarily interested in how possible sabotage in decision initiation and implementation interact to affect the allocation of authority as the key organizational outcome.

<sup>7</sup>In treatment No Implementation & Decision Important we had one matching group of 4 subjects, and in treatment Implementation & Decision Unimportant we had one matching group of 6 subjects. Since these matching groups are too small to exclude repeated game effects, we disregard them in the ensuing analysis.

<sup>8</sup>We ran a second experiment after the one reported here in the treatments Unimportant Decisions. Subjects were informed about this at the start of the sessions, but did not initially learn anything about the contents of the second experiment. We informed subjects that the first and the second experiment were completely separated. To keep overall payments comparable, subjects received a fixed fee of 3 euros in the treatments Important Decisions to compensate for the lack of earnings from the second experiment. More information on the second experiment is available upon request.

Predictions are straightforward if managers and workers maximize their own expected payoffs. In the treatments with implementation, workers maximize their payoffs by exerting the maximum implementation effort. The treatments without and with implementation stage are then strategically equivalent, since final project payoffs are identical. Fully and partially informed managers with decision rights then choose project Manager-High. Fully informed workers with decision rights choose project Worker-High. But partially informed workers with decision power choose project Manager-High.<sup>9</sup> Workers receive higher expected payoffs if they gather information and project Manager-High is implemented than if they gather no information and projects are chosen in the dark.<sup>10</sup> Workers thus gather information even if managers keep control to then implement project Manager-High. Managers consequently keep authority to ensure that their favorite project Manager-High is always implemented.

Actual behavior in experiments is affected by all sorts of unsystematic unobservables. We are thus less interested in point predictions but focus on comparative statics. Predictions based on fully rational individuals maximizing their own expected monetary payoff are summarized as follows:

### **Hypothesis 1 (Selfish Preferences: Delegation)**

1. *Managers delegate decision rights equally often in both the treatments with and without implementation.*
2. *Managers do not condition their delegation choices more strongly on whether there is implementation in the treatments with unimportant decisions for workers than in the treatments with important decisions for workers.*

We of course believe that workers and managers actually have social preferences that affect their behavior. We first focus on predictions that result no matter whether workers have outcome-based and/or reciprocal social preferences.<sup>11</sup> In a previous version of this paper we have explicitly analyzed the behavior of inequity averse managers and workers following Fehr

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<sup>9</sup>In the treatments in which the decision is important for workers, this holds since  $70 > 0.5(100 - 50) = 25$ . In the treatments in which decisions are less important for workers, this holds since  $70 > 0.5(100 + 10) = 55$ .

<sup>10</sup>In the treatments with important decisions for workers, the relevant inequality is  $70 - 5 = 65 > 40$ . In treatments with unimportant decisions for workers, the condition is  $70 - 5 = 65 > 60$ .

<sup>11</sup>Outcome based social preferences are, for example, discussed in Fehr & Schmidt (1999), Charness & Rabin (2002), and Konow (2003). Reciprocal preferences are, for example, discussed in Rabin (1993), Levine (1998), Dufwenberg & Kirchsteiger (2004), and Falk & Fischbacher (2006).

& Schmidt (1999). The analysis is tedious; it is available from the authors upon request. In the following we focus on an intuitive derivation of hypotheses. Assume that workers have distributional, efficiency, and reciprocity concerns. Social preferences work primarily via two channels: implementation effort and information gathering. We first discuss these two channels separately, and consequently argue that the relative importance of these channels depends on how important it is for workers that their organizations take the right overall decisions.

Consider first the impact of social preferences on project implementation. Total surplus is always increasing in effort. Payoff differences between managers and workers are decreasing in effort when implementing project Worker-High. Project Worker-High is most preferred by workers so that reciprocal workers have little incentives to sabotage efficient implementation. Workers with social preferences should thus exert full implementation effort. Total surplus is also increasing in effort when implementing project Manager-High. But now managers get higher payoffs than workers if workers supply maximum effort. Inequity averse workers dislike this. Reciprocal workers might dislike being forced to implement project Manager-High rather than project Worker-High. Worker with social preferences might thus exert less than maximum effort implementing project Manager-High. Finally, project Both-Low is unlikely to be deliberately chosen by workers and managers with decision rights, since both prefer the other projects. Reciprocity concerns are then unlikely to affect effort since the unfortunate project choice is caused by the workers refusing to gather information. Total surplus is increasing and payoff differences are decreasing in effort when implementing project Both-Low. Workers with social preferences thus exert full effort when implementing project Both-Low. Summarizing, workers with social preferences might sabotage implementation of project Manager-High, whereas they implement the other projects with maximum effort.

Consider next the project choices of managers and workers. Fully informed workers select project Worker-High since this maximizes their payoff and the total surplus, and at the same time avoids disadvantageous inequality. Reciprocity should not have a big impact since project Worker-High is also not too bad for managers either. Partially informed workers face a more difficult decision. Picking the known project Manager-High maximizes their expected payoffs and expected total surplus. Workers also only end up in this decision situation if managers kindly delegated decision rights but workers were then unlucky to get only partial information. Managers are not to blame, so that reciprocity concerns should – if anything –

increase the motivation of workers to opt for the save option. But selecting project Manager-High results in disadvantageous inequality. Workers might thus decide to select an unknown and thus risky project if they suffer strongly from disadvantageous inequality. Yet we should observe this less often in the treatments with important rather than unimportant decisions. Fully and partially informed managers are very likely to chose project Manager-High in the treatments with no implementation. The reason is that project Manager-High then maximizes their own payoff and avoids disadvantageous inequality. It does not maximize total surplus if managers are fully informed, and it slightly hurts workers who after all were so kind to gather information. But these effects are small as compared to the material self-interest of managers. In the treatments with implementation, managers face a more difficult decision, since workers with social preferences might sabotage implementation. However, the resulting tendency not to choose project Manager-High is smaller in the treatment where the decision is important for workers.

Consider next the impact of social preferences on information gathering. Workers with social preferences and decision authority have strong incentives to gather information: they thereby increase their own expected payoffs and expected total surplus. But workers might be less inclined to gather information if managers keep decision authority to ensure the choice of project Manager-High. This holds as workers can reduce the probability of suffering from disadvantageous inequity by remaining ignorant. Reciprocal workers also probably prefer managers to delegate: workers with formal authority can use any information that they gather to the mutual advantage of everybody. But refusing to gather information is more costly for workers if making the right decisions is important for them. It is thus likely that workers respond more strongly to the delegation decision of managers in the treatments where the decision is important for workers than in the treatments where the decision is less important for workers.<sup>12</sup>

Social preferences therefore make it more attractive for managers to delegate. First, if project Manager-High is relatively inefficiently implemented, managers actually earn higher payoffs by choosing project Worker-High. This eliminates their very reason to keep authority. Second, if workers do not gather information under centralization, formal authority is useless.

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<sup>12</sup>In our treatment with no implementation and important decision, workers with Fehr & Schmidt (1999) preferences always gather information, even if managers keep formal authority. This partly explains our choice of the experimental parameters.

However, the relative importance of the two roles of workers – decision initiation and implementation – depends on how important the project choice is for workers. In the treatments with important decision, it is very costly for workers not to gather information under centralization. In that case, the delegation decision of managers is more strongly affected by whether or not there is an implementation stage. The reason is that workers can effectively express their social preferences only by sabotaging implementation. In the treatments with unimportant decisions, it is cheap for workers to “punish” managers by not gathering information under centralization. In that case the information gathering response of workers to the delegation decisions of managers might already be enough to render delegation optimal for managers. The delegation decisions are then less strongly affected by whether there is an implementation stage. This is summarized in the following hypotheses:

### **Hypothesis 2 (Social Preferences: Delegation)**

- 1. Managers delegate decision rights more often to workers in the treatments with implementation than in the treatments without implementation.*
- 2. Managers condition their delegation choices more strongly on whether there is an implementation stage in the treatments where the decision is important for workers than in the treatments where the decision is less important for workers.*

We are finally interested whether workers have reciprocal preferences; implementation effort then depends not only on which project has been chosen for implementation, but also on how the project choice has come about. Reciprocity concerns can arise for several reasons. Frey et al. (2004), Benz & Frey (2008), Fuchs-Schündeln (2009), Bartling et al. (2013), and Owens et al. (2014) suggest that individuals value decision authority as such. Reciprocal workers should then punish managers for keeping decision authority as such, not matter what decisions are finally taken. Such punishment can come in the form of refusing to gather information, or by exerting less than full implementation effort. Reciprocal workers might also hold managers particularly responsible if they actively take decisions that hurt workers. Such instrumental procedural preferences are proposed and investigated by Sebald (2010) and Aldashev et al. (2010). Reciprocal workers should then reduce effort specifically if fully informed managers force them to implement project Manager-High.<sup>13</sup>

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<sup>13</sup>Participants might also have procedural social preferences as discussed in Bolton, Brandts & Ockenfels (2005), Trautmann (2009), and Krawczyk (2011). People with such procedural preferences are more willing to accept unequal outcomes if these result from procedures with ex-ante equal expected payoffs. But Eliaz &

As we argued above, workers with outcome-based social preferences and reciprocity concerns might not gather information if managers keep formal authority. We cannot use information gathering decisions to investigate procedural preferences. However, reciprocity preferences have unique implications for project implementation. For workers with outcome-based social or selfish preferences, it is irrelevant whether managers chose to implement project Manager-High, or whether workers did so themselves. Moreover, it is irrelevant whether managers could have made an informed choice of project Worker-High. When workers are reciprocal and therefore care about how decisions are taken, however, effort levels on the same project Manager-High may depend on how the project choice was taken. In particular, workers exert less effort implementing project Manager-High if fully or partially informed managers made the project choice rather than partially informed workers themselves. This is summarized in the following hypothesis.

**Hypothesis 3 (Procedural Concerns: Implementation)** *Workers implement project Manager-High with higher effort if they rather than their managers have chosen the project for implementation.*

This hypothesis focuses on the overall impact of procedural concerns by emphasizing the contrast to the predictions based on outcome-based preferences. The hypothesis does not pick up on the subtle difference in reciprocity concerns discussed above. We will come back to this distinction in our discussion of the results.

## 4 Results

Table 3 summarizes our main result. The allocation of decision rights differs decidedly from the predictions based on selfish individuals maximizing their own monetary payoff. Instead of the predicted delegation percentage of 0%, delegation percentages are much higher and range between 35% to 78%. Most importantly for our research question, delegation percentages also increase with the presence of an implementation stage. Taking all periods into account, the increase in the delegation percentage is from 39% to 72% and thus substantial if the

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Rubinstein (2014) and Chlaß, Güth & Miettinen (2014) show that people have marked preferences also over choice procedures that result in essentially the same outcome distributions. We do not develop behavioral predictions based on procedural social preferences, not because these preferences might not be relevant, but because we are not quite sure how to apply these models in our – relatively complicated – dynamic game. See also Trautmann & Wakker (2010) and Fudenberg & Levine (2012) who show that procedural preferences lead to problems with time inconsistency and the independence axiom.

project choice is important for workers. The increase is from 64% to 70% and thus much less pronounced if the project choice is less important for workers. Outcomes are virtually the same no matter whether we look at all periods or only the second half of the experiment. Any learning therefore takes place quickly.

Our impressions are confirmed by Mann-Whitney ranksum tests. Accounting for all periods, there are significant differences in delegation with and without implementation if decisions are important ( $p$ -value of 0.01). There are no significant differences if the decisions are unimportant for workers ( $p$ -value of 0.25). Results are the same if we focus on the second half of the experiment ( $p$ -value of 0.01 and 0.65).

Table 3: Delegation Frequencies

	No Implementation	Implementation	$p$ -value
Periods 1-20			
Decision Important	0.39	0.72	0.01
Decision Unimportant	0.64	0.70	0.25
Periods 11-20			
Decision Important	0.35	0.78	0.01
Decision Unimportant	0.68	0.73	0.65

Average delegation fractions.  $p$ -values are from Mann-Whitney ranksum tests.

Managers thus delegate significantly more in case workers can obstruct implementation, but if and only if project decisions are really important for workers. This is partly consistent with our Hypothesis 2.1 and fully consistent with our Hypothesis 2.2. Remember that these hypotheses are based on the assumption that managers and in particular workers have social preferences. Observed delegation behavior is not consistent with our Hypothesis 1 that is based on the assumption that managers and workers maximize only their own expected payoffs.

Table 4: Manager Profits

	Delegation	Centralization	<i>p</i> -value
Periods 1-20			
No Implementation & Decision Important	81.89	82.28	0.61
Implementation & Decision Important	80.19	66.34	0.02
No Implementation & Decision Unimportant	78.57	67.81	0.02
Implementation & Decision Unimportant	76.44	63.12	0.01
Periods 11-20			
No Implementation & Decision Important	85.05	82.67	0.60
Implementation & Decision Important	80.44	69.98	0.05
No Implementation & Decision Unimportant	78.52	68.54	0.02
Implementation & Decision Unimportant	77.12	61.23	0.07

Average manager profits conditional on delegation choices in the different treatments.

*p*-values are from Wilcoxon signrank tests.

We next explore the link between delegation choices and manager profits. We summarize average manager payoffs conditional on delegation choices in Table 4. Looking at all periods, managers who delegate always receive higher average payoffs except in the treatment where there is no implementation and the decision is important for workers. In this treatment, workers essentially cannot express their social preferences, because implementation is ensured by design, while sabotaging information gathering is prohibitively costly. Wilcoxon signrank tests support these observations: managers who delegate receive higher payoffs than managers who keep authority (*p*-values of 0.01 and 0.02) unless there is no implementation and the decision is important for workers (*p*-value of 0.61). Results are the same if we look at only the last 10 periods.<sup>14</sup>

Summarizing our main results, we find that the possibility to obstruct decision initiation and implementation interact: the possibility to thwart implementation affects the allocation

<sup>14</sup>Since delegation decisions are endogenous and managers with decision authority affect project choices, we cannot make the causal claim that delegation increases manager payoffs. The reason is that managers who keep authority might, for example, be rather socially insensitive, make bad project choices, and thus ultimately receive low payoffs.

of authority as key organizational outcome, but only if sabotaging decision initiation is no real option. This implies that the results from the experimental literature on delegation and implementation cannot be fully translated to all those organizations in which decision initiation and implementation are in the same hands and in which interfering with the decision making process is a realistic option to voice discontent. We next explore the underlying reasons for the observed patterns of delegation by looking at implementation effort, project choices, and information gathering in greater detail.

#### 4.1 Implementation

In our treatments with implementation, workers determine their effort levels after the project has been chosen for implementation. Table 5 summarizes the effort decisions. Consider first the results taking all periods into account. Workers exert similar and high effort implementing projects Worker-High (9.66 and 9.82) and Both-Low (9.58 and 9.80). Workers exert less effort implementing project Manager-High (8.16 and 8.74). The differences in implementation effort are statistically significant ( $p$ -values between 0.01 and 0.05). Results are essentially the same when we only consider the second half of the experiment. The one exception is that due to few observations - project Both-Low is never implemented in some matching groups during the second half of the experiment - the difference in implementation effort for projects Manager-High and Both-Low is only marginally significant in the treatment where the decision is important for workers ( $p$ -value of 0.11).

Table 5: Implementation Effort Choices

	Project Choice			<i>p</i> -value
	Manager-High	Worker-High	Both-Low	
Periods 1-20				
Decision Important	8.16	9.66		0.02
		9.66	9.58	0.52
	8.16		9.58	0.05
Decision Unimportant	8.74	9.82		0.02
		9.82	9.80	1.00
	8.74		9.80	0.04
Periods 11-20				
Decision Important	8.22	9.68		0.02
		9.68	10.00	0.32
	8.22		10.00	0.11
Decision Unimportant	9.14	9.96		0.05
		9.96	10.00	0.32
	9.14		10.00	0.05

Average implementation effort choices conditional on the chosen project.

*p*-values are from Wilcoxon signrank tests.

Workers therefore implement projects Manager-High with less than the efficient (maximum) effort. Social preferences and their behavioral consequences seem to make it less attractive for managers to keep control. Since effort choices only matter if there is an implementation stage, the latter makes delegation relatively more attractive for managers. This can partly explain why managers delegate more in the presence of an implementation stage. But the aggregate impact of social preferences on effort choices is relatively small. To better understand the delegation decisions of managers, we next look at project choices.

## 4.2 Project Choices

Decision rights only have instrumental value because they can determine project choices. If workers do not acquire information, the decision makers (managers or workers) choose in

the dark. We thus focus on project choices after workers acquired information. Managers and workers then have either full or partial information. Under full information, project Both-Low is almost never chosen. The relevant choice is thus between Manager-High and Worker-High. Under partial information, the choice is between project Manager-High for sure, or a random choice between projects Worker-High and Both-Low. Under both full and partial information we can consequently characterize project choices by focusing on the fraction of choices for project Manager-High. Table 5 provides an overview.

We first consider the decisions of managers. Manager with partial information almost always opt for the project Manager-High (100% to 99%) no matter whether we look at the entire or only the second half of the experiment. Looking at all periods, managers with full information also choose project Manager-High (99% and 89%) if there is no subsequent implementation stage. This holds even more during the second half of the experiment, where managers always choose project Manager-High. But fully informed managers choose project Manager-High less often (64% to 73%) if workers consequently decide on their implementation effort. Looking at all periods, the difference in project choices is not statistically significant when comparing the treatments with and without implementation if decisions are unimportant for workers ( $p$ -value of 0.32). But the differences in project choices are statistically significant comparing the treatments with and without implementation if decisions are important for workers ( $p$ -value of 0.01). The possibility to obstruct implementation always changes significantly the project choices of managers when focusing on the second half of the experiment ( $p$ -values of 0.02 and 0.08).

We next consider the project choices of workers. Workers with full information almost always choose their preferred project Worker-High: they hardly opt for project Manager-High (0% to 1%). Workers with partial information predominantly choose the known and thus safe project Manager-High (75% to 98%). Workers significantly change the frequency with which they select project Manager-High in case avoiding project Both-Low is really important for them ( $p$ -values from 0.00 to 0.03 not reported in the table). There are no substantial learning effects for workers.

Table 6: Fraction of Choices of Project Manager-High

	Manager Decides		Worker Decides	
	Partial Info	Full Info	Partial Info	Full Info
Periods 1-20				
No Implementation & Decision Important	1.00	0.99	0.93	0.01
Implementation & Decision Important	1.00	0.71	0.95	0.00
<i>p</i> -value	n.a.	0.01	0.95	0.25
No Implementation & Decision Unimportant	1.00	0.89	0.75	0.00
Implementation & Decision Unimportant	0.99	0.73	0.78	0.00
<i>p</i> -value	0.45	0.32	0.57	n.a.
Periods 11-20				
No Implementation & Decision Important	1.00	1.00	0.98	0.00
Implementation & Decision Important	1.00	0.64	0.97	0.00
<i>p</i> -value	n.a.	0.02	0.88	n.a.
No Implementation & Decision Unimportant	1.00	1.00	0.77	0.00
Implementation & Decision Unimportant	1.00	0.68	0.76	0.00
<i>p</i> -value	n.a.	0.08	0.85	n.a.

Average fractions with which project Manager-High is chosen conditional on the allocation of decision rights and the information of the decision taker. *p*-values are from Mann-Whitney ranksum tests. *p*-value are not available if there is no variation in the data.

In the treatments with implementation, managers thus seem to realize that they need the good will of workers for successful implementation. They therefore often opt for project Worker-High. This makes it of course less beneficial to hold decision authority in the first place, which after all has the purpose of ensuring the choice of project Manager-High. In addition to the effort choices of workers, this offers an explanation for why delegation is particularly frequent in the treatments with implementation.

### 4.3 Information

We next study how delegation decisions affect the information gathering by workers. Table 7 summarizes information gathering fractions. Workers essentially always gather information if they also hold decision power (94% to 100%). But information gathering drops if managers keep authority (between 23% to 79%). Wilcoxon signrank tests reveal that the differences in information gathering are statistically significant ( $p$ -values between 0.02 and 0.05). This behavior is very similar across treatments. It does not depend on whether we look at all or only the last 10 periods of the experiment.

Hypothesis 2.2 argues that implementation should have a bigger effect on delegation decisions if making the right decisions is more important for workers. The reason is that not gathering information is more costly to workers if making the right decisions is important for them. The incentive effect of delegation is the information gathering rate following delegation minus the information gathering rate following no delegation. The incentive effect of delegation indeed seems to be larger in treatments where decisions are important. We use Mann-Whitney ranksum tests to compare the incentive effect of delegation between the treatments with important and unimportant decisions. We do not report the  $p$ -values in the table. The differences in the incentive effect of delegation are always statistically significant ( $p$ -values less than 0.01). The picture remains the same if we focus on the second half of the experiment ( $p$ -value smaller than 0.02). Workers consequently reduce their information gathering if their managers keep rather than delegate decision rights. This response to centralization is likely to be driven by the social preferences of workers - by the chosen parameters workers maximize their expected payoffs by always gathering information irrespective of the delegation decision of managers.

Overall, we find that social preferences thus render delegation more attractive. First, keeping control actually becomes useless if managers consequently do not receive the information required to make the right decisions. Second, keeping control has little instrumental value if workers do not implement the chosen project Manager-High with full effort. Finally, keeping control is useless if managers in the end refrain from choosing project Manager-High because workers then sabotage project implementation.

Table 7: Information Gathering

	Delegation Choice		
	Delegation	Centralization	<i>p</i> -value
Periods 1-20			
No Implementation & Decision Important	0.99	0.77	0.03
Implementation & Decision Important	0.99	0.74	0.02
No Implementation & Decision Unimportant	0.97	0.23	0.02
Implementation & Decision Unimportant	0.94	0.38	0.02
Periods 11-20			
No Implementation & Decision Important	0.99	0.79	0.05
Implementation & Decision Important	1.00	0.78	0.05
No Implementation & Decision-Unimportant	0.96	0.19	0.02
Implementation & Decision Unimportant	0.95	0.32	0.02

Average information gathering fractions conditional on delegation choices in the different treatments. *p*-values are from Wilcoxon signrank tests.

#### 4.4 Procedural Concerns

We finally study to what extent the effort choices of workers reflect reciprocity concerns. To this end, we manipulate the information available to decision makers so that we can observe different procedures that lead to the choice of the same project Manager-High. Partially informed workers often choose project Manager-High. We do not consider situations where project Manager-High was only accidentally chosen by uninformed decision makers. Fully informed workers never chose project Manager-High. We thus focus on three situations which led to the choice of project Manager-High: partially informed managers, fully informed managers, and partially informed workers. Table 8 reports the average effort level for these three cases.

Workers clearly exert more effort if they have chosen project Manager-High themselves (8.78 to 9.40) than if fully informed managers have chosen the project (4.06 to 5.60). The differences in behavior are statistically significant (*p*-values between 0.03 and 0.09). Over all periods, workers also exert less effort when managers have chosen project Manager-High

under partial information (6.60 and 6.77) than when they have chosen the project themselves. These differences in behavior are significant ( $p$ -values of 0.03 and 0.04). But the effort differences vanish and becomes insignificant over time: effort after the decisions by partially informed managers increases to 8.32 and 9.33 and is thus no longer significantly different from the effort choices in case workers chose the project themselves ( $p$ -values of 0.41 and 0.90). Our findings are therefore largely – but not entirely – consistent with Hypothesis 3 according to which workers choose lower implementation effort if the project has been imposed on them by their managers rather than chosen by the workers themselves.

At first sight, one might conclude that workers respond reciprocally to the withdrawal of autonomy as such. But experienced workers seem to realize that they would have made the same project choice as the manager did, and that there is thus no reason to punish the manager for making this choice. This interpretation is supported by the observation that workers also exert more effort if partially rather than fully informed managers chose project Manager-High. These differences in behavior are significant ( $p$ -values between 0.03 and 0.09) with one exception: in the treatment with implementation and unimportant decision we cannot reject that effort choices are the same when looking at all periods ( $p$ -value of 0.14). Overall, our data suggest that in the end workers' reciprocity concerns matter only if managers abuse their power, that is, when different procedures lead to different project choices.

One caveat for the interpretation of our results is a potential endogeneity bias. In the above situations, workers could have punished the manager for keeping control by not gathering information. As argued above, we focus on situations where workers have decided not do sabotage the decision process. Workers for which we observe their effort choices implementing project Manager-High chosen by the manager is thus a selected sample. Not gathering information is more costly in the treatment where the decision is important for workers. We would consequently expect the self-selected sample of workers to be the more reciprocal the more important the decision. Consequently, we would expect differences in effort choices to be more pronounced in the treatments in which the decision is important for workers.

The behavioral effects indeed seem to be more pronounced in the treatment with important decision. However, comparing effort for a given choice procedure – partially and fully informed

Table 8: Implementation Effort for Project Manager-High

	Manager Decides		Worker Decides	
	Partial Info	Full Info	Partial Info	<i>p</i> -value
Periods 1-20				
Decision Important	6.77	4.98		0.03
		4.98	8.90	0.03
		6.77	8.90	0.03
Decision Unimportant	6.60	6.30		0.14
		6.30	9.10	0.06
		6.60	9.10	0.04
Periods 11-20				
Decision Important	8.32	4.06		0.04
		4.06	8.78	0.05
		8.32	8.78	0.41
Decision Unimportant	9.33	5.60		0.09
		5.60	9.40	0.09
		9.33	9.40	0.90

Average implementation effort choices conditional on the choice procedure.

Only the treatments with implementation stage are considered.

*p*-values are from Wilcoxon signrank tests.

managers – across treatments yields no significant behavioral differences (*p*-values from Mann-Whitney ranksum tests between 0.14 and 0.85 not reported in the table). In case managers delegate, workers always gather information, so selection is no issue. We reassuringly do not observe significant behavioral differences across treatments (*p*-values of 0.77 and 0.23). We therefore believe that selection does not strongly distorts our results. In any case, selection would only work against us finding evidence supporting the importance of reciprocal concerns. Our experiment results thus strongly suggest that reciprocity concerns matter in the context of the delegation of decision rights. But a precise quantification of the effect is left for future research.

## 5 Conclusion

In this study we explore how the delegation of decision rights affects organizational decisions and their subsequent implementation if the same members of the organization are responsible for decision initiation and decision implementation. We find that the possibility to obstruct project implementation increase delegation from 39% to 72% in case bad project choices strongly hurt workers. Delegation increase only from 64% to 70% and thus much less in case the right project choices are not that crucial for workers. Our results thus suggest that the importance of potential implementation problems depends on how costly it is for members of the organization to sabotage the information gathering prior to decision making. The results from the experimental literature – organizations delegate decision rights to improve implementation – must be qualified.

Our results also have potential implications for organizational design. If members of the organization sabotage decision making – if bad decisions have no severe consequences for them – organizations must delegate to ensure good decisions. Implementation problems are then secondary, and eliminated by delegation along the way. If members of the organization are unlikely to sabotage the decision making process – as bad decisions strongly affect everybody in the organization – organizations can refrain from delegation, but then must pay special attention to ensure efficient implementation.

Our results suggests two potentially fruitful avenues for future research. In our experiments, workers face positive but small and exogenous monetary incentives to efficiently implement organizational decisions. But real organizations jointly decide on the level of delegation and the use of incentives. Our results suggests that organizations might have to complement centralization with strong incentives to ensure implementation, since upset members of the organization might want to punish the withholding of decision autonomy by sabotaging implementation. This contrasts the usual argument that organizations must employ incentives to counterbalance the loss of control resulting from delegation, see for example Prendergast (2002). Experiments could extend the current design so that managers can not only decide whether or not to delegate, but also set the incentive strength during implementation. This might inform the empirical accounting and management literature – for example Nagar (2002) and Abernethy, Bouwens & van Lent (2004) – which suggests that the link between delegation and the use of incentives is complicated.

An additional avenue for future research would be to identify the importance of reciprocity and attribution for the behavioral effects of delegation. Our results clearly indicate that reciprocity matters, even though procedural concerns could also play a role. But the precise importance of reciprocity is unclear. It would be interesting to find an experimental design that exogenously manipulates reciprocity concerns to quantify the importance of reciprocity. This could have important implications for the development of new organizational theories, since for example the model by Aghion & Tirole (1997) includes the possibility that members of the organization have outcome-based social preferences, but no longer makes the right predictions if procedural preferences like reciprocity affect behavior.

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## **Appendix: Instructions**

### **General Remarks**

The instructions for all treatments were identical except for the payoff combinations of the three investment projects and whether or not there is an implementation stage. These sample instructions are from the treatment with unimportant decisions and with and without implementation stage. In these treatments the main experiment was followed by a second experiment. Instructions for the second experiment are available upon request. We clarify at the beginning of the instructions that the two parts are completely separated. Instructions for the different parts of the experiment were handed out separately, and only after all subjects had completed the previous part or parts. Spillovers from the second to the first experiment are thus ruled out.

Instructions for the treatments with important decisions differ from the following instructions in the description of the payoffs, and in that we there did not conduct a subsequent second experiment. The conversion rate is the same, yet in order to keep overall final payoffs similar, we included an additional show-up fee of 3 euros. Otherwise, the instructions are identical.

In all treatments, subjects filled out a questionnaire after at the end of the experiment. The questionnaire is not included. Subjects had to computerized answer control questions before the experiment could start. The control questions are attached at the end of the appendix. The current general remarks and the title were, of course, not included in the instructions for the experimental subjects.

### **Instructions**

Thank you for participating in this experiment. The amount of money you earn depends upon the decisions you and the other participants make. Today's session consists of two separate experiments: Experiment 1 and Experiment 2. These experiments are completely separated. Thus, in each experiment you will interact with different individuals, and your actions in one experiment will have no consequences at all in the other experiment.

In each of the two experiments you can earn points. The conversion rate is such that 1 point corresponds with 1 eurocent (so that 100 points equals 1 euro). Your overall earnings equal the sum of your points earned in the two experiments.

We will pay out your overall earnings in cash after you have completed both experiments and filled out a final questionnaire. We ensure that your final earnings remain confidential: no other participant will learn your final earnings.

Below you will find the instructions for Experiment 1. Instructions for Experiment 2 follow after the first experiment has been completed. Please do not communicate with other participants during the session. If you have a question, please raise your hand. The experimenter will then come to your table to answer your question in private.

## Experiment 1 [ No Implementation Stage ]

In Experiment 1 there are two types of participants: managers and workers. One half of the participants will be managers, the remaining half will be workers. You will be randomly assigned one of these roles. Which role you have, you will learn at the start of Experiment 1. Your role will not change during this experiment.

Experiment 1 consists of 20 project implementation decisions (i.e., 20 periods). For each project implementation decision, one manager and one worker are randomly paired. You are never paired with the same other participant twice in a row.

In every project implementation decision, manager and worker face three projects (**A,B,C**) that can be implemented. These projects differ in the points that they yield manager and worker upon implementation. Three payoff combinations are possible. One project labeled 'Manager High' yields **90 points to the manager and 70 points to the worker**, one project labeled 'Worker High' yields **80 points to the manager and 100 points to the worker** and one project labeled 'Both Low' yields **10 points to the manager and 10 points to the worker**. The problem is that manager and worker do not a priori know which payoff combination corresponds to which project. Each period the three payoff combinations are randomly assigned to projects A, B and C. Thus over the periods project A corresponds to different payoff combinations etc.

The manager initially decides whether to take the final project implementation choice, or whether to delegate this decision to the worker. Before the project implementation decision is made (either A, B, or C), the worker can choose whether or not to gather information on the payoffs of the projects. Gathering information on the projects costs the worker **5 points**.

### Sequence of Actions

The precise timing of the decisions and the resulting distribution of information that follows from these decisions are as follows. There are three phases:

#### *Phase 1*

The manager chooses between **Delegation** and **No Delegation**.

#### *Phase 2*

The worker observes the manager's delegation choice. The worker then chooses between **Information** and **No Information**. Information costs the worker 5 points.

Depending on the worker's information gathering decision, worker and manager may or may not learn the characteristics of the three projects before the implementation decision is taken.

If the worker has chosen **Information**, both the worker and the manager always learn which of the three projects A, B or C corresponds to the '**Manager High**' payoff combination (that is, 90 for the manager and 70 for the worker). Whether they receive additional information on the other projects depends on chance. With **50%** probability also the payoffs of the two other projects become known. With the remaining **50%** probability both worker and manager do not learn to which projects the two other payoff combinations correspond.

If the worker has chosen **No Information**, no information about the projects is revealed at all to both the worker and the manager before the implementation decision is taken.

### *Phase 3*

If the manager opted for Delegation in Phase 1, the worker chooses which project to implement. He or she can choose between either A, B, or C. If the manager opted for No Delegation in Phase 1, the manager decides him- or herself which project to implement.

### **Payoffs**

The three possible payoff combinations of the projects are summarized in the table below:

	<b>'Manager High'</b>	<b>'Worker High'</b>	<b>'Both Low'</b>
<b>Manager</b>	90	80	10
<b>Worker</b>	70	100	10

The number of points earned by manager and worker are their points from the implemented project as given in the table above, minus for the worker, the costs of the information gathering decision (either 5 or 0 points).

After each project implementation decision (period) you will get an overview of the decisions you and the participant you were matched with took in that period. You will also learn the payoffs that you and the other participant you were matched with earned.

Your overall payoffs from Experiment 1 equal the sum of points earned in the 20 project implementation decisions.

### **Experiment 1 [ Implementation Stage ]**

In Experiment 1 there are two types of participants: managers and workers. One half of the participants will be managers, the remaining half will be workers. You will be randomly assigned one of these roles. Which role you have, you will learn at the start of Experiment 1. Your role will not change during this experiment.

Experiment 1 consists of 20 project implementation decisions (i.e., 20 periods). For each project implementation decision, one manager and one worker are randomly paired. You are never paired with the same other participant twice in a row.

In every project implementation decision, manager and worker face three projects (**A,B,C**) that can be implemented. These projects differ in the points that they yield manager and worker upon implementation. Three payoff combinations are possible. One project labeled 'Manager High' yields **90 points at most to the manager and 70 points at most to the worker**, one project labeled 'Worker High' yields **80 points at most to the manager and 100 points at most to the worker**

and one project labeled 'Both Low' yields **10 points at most to the manager and 10 points at most to the worker**. The problem is that manager and worker do not a priori know which payoff combination corresponds to which project. Each period the three payoff combinations are randomly assigned to projects A, B and C. Thus over the periods project A corresponds to different payoff combinations etc.

The decision right which project to implement initially resides with the manager. But the manager may delegate this decision to the worker. Before the project implementation decision is made (either A, B, or C), the worker can choose whether or not to gather information on the payoffs of the projects. Gathering information on the projects costs the worker **5 points**. After the project implementation decision is made, the worker chooses how much effort to exert to successfully complete the project. The more effort the worker puts in, the closer the actual payoffs are to the maximum payoffs possible.

### **Sequence of Actions**

The precise timing of the decisions and the resulting distribution of information that follows from these decisions are as follows. There are three phases:

#### *Phase 1*

The manager chooses between **Delegation** and **No Delegation**.

#### *Phase 2*

The worker observes the manager's delegation choice. The worker then chooses between **Information** and **No Information**. Information costs the worker 5 points.

Depending on the worker's information gathering decision, worker and manager may or may not learn the characteristics of the three projects before the implementation decision is taken.

If the worker has chosen **Information**, both the worker and the manager always learn which of the three projects A, B or C corresponds to the '**Manager High**' payoff combination (that is, at most 90 for the manager and at most 70 for the worker). Whether they receive additional information on the other projects depends on chance. With **50%** probability also the payoffs of the two other projects become known. With the remaining **50%** probability both worker and manager do not learn to which projects the two other payoff combinations correspond.

If the worker has chosen **No Information**, no information about the projects is revealed at all to both the worker and the manager before the implementation decision is taken.

#### *Phase 3*

If the manager opted for Delegation in Phase 1, the worker chooses which project to implement. He or she can choose between either A, B, or C. If the manager opted for No Delegation in Phase 1, the manager decides him- or herself which project to implement.

#### *Phase 4*

Both manager and worker learn the payoff characteristics of the project implemented. The worker then chooses how much effort to exert to successfully complete the implemented project. Effort is

an integer between 0 and 10. The payoffs manager and worker obtain from the project are increasing in the worker's effort.

### Payoffs

The worker's effort determines the actual payoffs obtained from the project implemented, as follows:

	<b>'Manager High'</b>	<b>'Worker High'</b>	<b>'Both Low'</b>
<b>Manager</b>	$40 + 5 \times \text{Effort}$	$30 + 5 \times \text{Effort}$	$0 + \text{Effort}$
<b>Worker</b>	$60 + \text{Effort}$	$90 + \text{Effort}$	$0 + \text{Effort}$

For example, if the implemented project corresponds to the 'Worker High' project and the worker chooses an effort level of 6, the manager earns  $30 + 5 \times 6 = 60$  points while the worker gets  $90 + 6 = 96$  points from the implemented project. Note that the larger the effort the worker puts in, the closer the actual payoffs are to the maximum payoffs possible. Further, putting in more effort benefits the manager more than the worker; and putting in less effort hurts the manager more than the worker.

The number of points earned by manager and worker are their points from the implemented project as given in the Table above, minus for the worker, the costs of the information gathering decision (either 5 or 0 points).

After each project implementation decision (period) you will get an overview of the decisions you and the participant you were matched with took in that period. You will also learn the payoffs that you and the other participant you were matched with earned.

Your overall payoffs from Experiment 1 equal the sum of points earned in the 20 project implementation decisions.

### Control questions. [Experiment 1, No Implementation Stage]

1. Is the following statement correct? The number of points that I earn in Experiment 1 equals the sum of the points that I earn in the 20 project implementation decisions. [true]
2. Is the following statement correct? I will keep the same role during all 20 project implementation decisions. [ true ]
3. Is the following statement correct? I will be matched with the same other participant during all 20 project implementation decisions. [ false ]
4. Is the following statement correct? In each period always one project corresponds to 'Manager High', one corresponds to 'Worker High' and one corresponds to 'Both Low'. [true]
5. Is the following statement correct? If the worker chooses Information, both manager and worker always learn the payoffs of all projects. [ false ]
6. Is the following statement correct? The manager and the worker always obtain the same information about the projects. [ true ]

7. Consider the following sequence of hypothetical decisions and events. In Phase 1 the manager chooses No Delegation. The worker chooses Information in Phase 2 and the payoffs of all projects become known. In Phase 3 the manager implements project C, corresponding to 'Manager High'. How much does the worker earn? [ 65 ]
8. Consider the following sequence of hypothetical decisions and events. In Phase 1 the manager chooses Delegation. The worker chooses Information in Phase 2 and the payoffs of only project B, corresponding to 'Manager High', become known. In Phase 3 the worker implements project B. How much does the manager earn? [ 90 ]

**Control questions. [Experiment 1, Implementation Stage]**

1. Is the following statement correct? The number of points that I earn in Experiment 1 equals the sum of the points that I earn in the 20 project implementation decisions. [true]
2. Is the following statement correct? I will keep the same role during all 20 project implementation decisions. [ true ]
3. Is the following statement correct? I will be matched with the same other participant during all 20 project implementation decisions. [ false ]
4. Is the following statement correct? In each period always one project corresponds to 'Manager High', one corresponds to 'Worker High' and one corresponds to 'Both Low'. [true]
5. Is the following statement correct? If the worker chooses Information, both manager and worker always learn the payoffs of all projects. [ false ]
6. Is the following statement correct? The manager and the worker always obtain the same information about the projects. [ true ]
7. Is the following statement correct? The more effort the worker puts in, the higher are the payoffs of both manager and worker. [ true ]
8. Is the following statement correct? Suppose the worker chooses low effort under project 'Manager High' and high effort under project 'Worker High'. The manager then earns more under project 'Worker High'. [ true ]
9. Consider the following sequence of hypothetical decisions and events. In Phase 1 the manager chooses No Delegation. The worker chooses Information in Phase 2 and the payoffs of all projects become known. In Phase 3 the manager implements project C corresponding to 'Manager High'. The worker chooses an effort level of 7 in Phase 4. How much does the worker earn? [ 62 ]
10. Consider the following sequence of hypothetical decisions and events. In Phase 1 the manager chooses Delegation. The worker chooses Information in Phase 2 and the payoffs of only project B, corresponding to 'Manager High', become known. In Phase 3 the worker implements project B corresponding to 'Manager High'. In Phase 4 the worker chooses an effort level of 5. How much does the manager earn? [ 65 ]