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The Intrinsic Value of Decision Rights

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Abstract

Philosophers, psychologists, and economists have long argued that certain decision rights carry not only instrumental value but may also be valuable for their own sake. The ideas of autonomy, freedom, and liberty derive their intuitive appeal – at least partly – from an assumed positive intrinsic value of decision rights. Proving the existence of this value and measuring its size, however, is intricate. Here, we develop an experimental method capable of achieving these goals. The data reveal that – across different parameterizations – the large majority of our subjects intrinsically value decision rights beyond their instrumental benefit. The existence of an intrinsic value of decision rights helps understand the allocation of decision rights in practice, and it has implications for their optimal allocation in organizations, economic institutions, and society at large.

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Keywords: decision rights, intrinsic value, authority.

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1. Introduction

The optimal allocation of decision rights is important for achieving efficient outcomes in organizations, markets, and society at large. In economics, the incomplete contracting literature led to an extensive analysis of institutions and organizations in terms of concepts like control rights, decision-making rules, or authority (e.g., Simon 1951, Grossman and Hart 1986, Hart and Moore 1990, Aghion and Tirole 1997). A common feature of these models is that decision rights are viewed as purely *instrumental* for achieving certain outcomes. In this paper, we ask the question whether decision rights are only a means to an end or whether they carry an *intrinsic value* beyond their instrumental value of providing the power to enforce preferred outcomes.[1]

Why should individuals value decision rights beyond their instrumental benefits? Social psychologists argue that "human needs" constitute a source of the intrinsic value of power and autonomy. McClelland (1975) postulates that "power" is one dominant human need (besides achievement and affiliation) in his "motivation theory". The "self-determination theory" by Deci and Ryan (1985) hypothesizes that "autonomy," i.e., the absence of being controlled, is one dominant human need (besides competence and relatedness). In this literature, needs are defined as "innate psychological nutriments that are essential for ongoing psychological growth, integrity, and well-being" (Deci and Ryan 2000, p. 229). In economic philosophy, the capabilities approach by Sen and Nussbaum (e.g., Sen 1985, Nussbaum 2000) makes a similar point by emphasizing that not only outcomes but also the freedom of choice is important for a person's quality of life: "The central capabilities are not just instrumental for further pursuits: they are held to have value in themselves, in making the life that includes them fully human" (Nussbaum 2000, p. 74). In moral and political philosophy, "individual autonomy" is regarded as a basic moral and political value (see, e.g., Christman 2011). John Steward Mill, for example, argues that "liberty" is "one of the elements of wellbeing" (1859, Chapter III).

[1] The idea that decision rights are intrinsically valued found a particular manifestation in Adam Smith's lectures on jurisprudence delivered at the University of Glasgow in 1762/63 already. He argued that slavery will never be abolished in a democracy of slave holders because "the love of domination and authority and the pleasure men take in having every[thing] done by their express orders, rather than to condescend to bargain and treat with those whom they look upon as their inferiors and are inclined to use in a haughty way; this love of domination and tyrannizing, I say, will make it impossible for slaves in a free country ever to recover their liberty" (Smith 1978, p. 186). We owe this reference to Jon Elster.

To empirically assess whether individuals value decision rights intrinsically, we develop a novel experimental method in which individuals directly reveal their intrinsic valuation through their choices. The basic idea behind the elicitation method is simple, and consists of two parts. Subjects play a delegation game in Part 1 in which "principals" indicate their *point of indifference* between keeping and delegating a decision right to an "agent." The decision right entails the right to choose a "project alternative" and an "effort level" that determines the probability of the project's success. At the point of indifference, keeping the decision right is implicitly associated with a monetary lottery that the principal's effort and project choice decisions generate. For this reason we call this the "control lottery" because the principal determined the properties of this lottery through his or her own decisions. Likewise, at the point of indifference, delegating the decision right is implicitly associated with a monetary lottery but this time the agent determined the characteristics of this lottery through his or her effort and project choice decisions. For this reason, we call it "delegation lottery." Thus, if the principal puts an intrinsic value on the decision right the following equation must hold at the point of indifference:

certainty equivalent of the control lottery + intrinsic value of decision right =
certainty equivalent of the delegation lottery.

From this equation follows that the principal values the control lottery less than the delegation lottery if and only if he puts a positive intrinsic value on the decision right. In other words, the principal is willing to pay a "control premium" if he intrinsically values the decision right, and this control premium can be measured by the difference between the certainty equivalent of the delegation lottery and the certainty equivalent of the control lottery.

We measure the values of the delegation and control lotteries in Part 2 of the experiment by eliciting the principal's certainty equivalents for them. Importantly, this value elicitation takes place *outside the context of the delegation game*, i.e., the principals' faced the *neutrally framed* lotteries generated through their decisions in the delegation game. However, we avoided any reference to the delegation game in this part so that subjects focused exclusively on the extrinsic ("instrumental") value components of these lotteries. The elicited certainty equivalents therefore capture the value of the lotteries outside the delegation context, i.e. they measure the pure instrumental value components of the decision right. It is then clear that if the instrumental value of the control lottery is smaller than the instrumental value of the delegation lottery, the principal must place a positive intrinsic value on the decision right.

Our main finding is that principals assign significantly *smaller* certainty equivalents to the neutrally framed control lotteries than to the neutrally framed delegation lotteries in Part 2. On average, the delegation lotteries are valued 16.7 percent more than the control lotteries. The data further show that most subjects assign a positive intrinsic value to decision rights. This result is consistently found across ten different parameterizations of our experimental framework, and the individual intrinsic valuations are correlated across games, suggesting that it is rooted in a relatively stable individual preference. Further, we find that the intrinsic value of decision rights is increasing in the principal's alignment of interest with the agent, and that it increases with the stake size of the decision. The latter finding is indicative of the external relevance of our laboratory results because it shows that the intrinsic value is not just the fixed monetary amount that we measure on average in our experiment, but that it increases in step with the payoffs under consideration.

Our experimental results contribute to the corporate finance and governance literature, where private benefits of control are at the center of the debate (e.g., Aghion and Bolton 1992). While private benefits are often interpreted as being material in nature, such as the tangible perquisites top executives enjoy (Jensen and Meckling 1976) or more direct forms of appropriation of corporate resources, the literature also refers to "private benefits of control as the 'psychic' value some shareholders attribute simply to being in control" (Dyck and Zingales 2004, p. 540). Aghion and Bolton (1992) discuss "the case of a business run by a family whose members attach value to the business remaining in the family" (p. 474) and model such values as "non-monetary elements" (p. 476) in a player's objective function. Similarly, to motivate private benefits of control, Hart and Moore (1995) claim that "among other things, managers have goals, such as the pursuit of power" (p. 568). Dyck and Zingales (2004) measure the private benefits of control from privately negotiated transfers of controlling blocks of shares in publicly traded companies. This empirical approach can only capture monetary and other common value components, and the authors explicitly note that it might "underestimate the value of control" (p. 542). The reason is that psychic private benefits of control are likely to be idiosyncratic and therefore "intrinsically difficult to quantify" (p. 541). Our experimental study allows us to prove that psychic benefits of control exist, i.e., that they are not only a conceivable possibility. Since a private benefit such as the intrinsic value of decision rights is non-transferable by nature, we believe that the proof of its existence makes a strong case for the relevance of non-contractible private benefits of control and the theoretical literature that evolved around them.[2]

Our findings are also related to the theoretical literature on the internal structure of organizations. Models of empire-building (Niskanen 1971) may, in part, be founded on an intrinsic value of decision rights, since it creates additional incentives to obtain and keep these rights. The intrinsic value of decision rights causes delegation frictions, and these can also have substantial motivational consequences. Aghion and Tirole's (1997) model of real and formal authority shows that delegating formal authority to an agent prevents the principal from overruling the agent, increasing the latter's incentive to acquire information about potential projects' payoffs. Delegation frictions can cause large inefficiencies if the project choice is more important to the agent than to the principal. In an experimental study, Fehr, Herz and Wilkening (forthcoming) find significant frictions in the principals' delegation of decision rights to agents even in situations where the principals' interests are well aligned with those of the agents.[3] Aghion and Tirole (1997) also discuss the "participation view of delegation" (p. 12): "Delegating a choice to the agent raises his utility and enables the principal either to lower the wage or to recoup authority on another decision" (p. 12/13). The existence of the intrinsic value of decision rights implies that the utility enhancing effect of delegation goes beyond its instrumental value. The consequences of increasing an agent's utility through delegating decision rights may be particularly important, for example, in moral hazard models with limited liability, where a

[2] Anecdotal evidence suggests that the intrinsic value of decision rights might even inhibit mergers due to disputes over the allocation of decision rights in the merged company. For example, the planned merger between Glaxo-Wellcome and SmithKline Beecham in 1998, which would have been the largest merger ever at that time, failed because the top executives of the merging firms were unable to agree on the division of decision rights in the merged entity. This case of merger failure was also described as a "clash of egos" (Morrow 1998). The firms finally merged two years later, after the retirement of the SmithKline Beecham CEO.

[3] Dominguez-Martinez, Sloof, and von Siemens (2012) provide experimental evidence consistent with this finding by showing that principals choose to control agents even if their interests are perfectly aligned. Also related, Owens, Grossman, and Fackler (2012) find that subjects rely excessively on their own answers to quiz questions rather than on those of matched subjects when the correctness of the answers determines their payoff.

principal delegates a task to an agent and a trade-off exists between rent extraction and providing efficient incentives. The agent will accept a *lower* monetary rent if an intrinsic value of decision rights helps satisfy his participation constraint, which mitigates the trade-off between rent extraction and incentive provision.

Finally, our findings have a bearing on the human resource management and industrial relations literatures that analyze different forms of workplace organization. Modern high-performance work systems (HPWS), among other things, grant decision rights to workers enabling them to act on their private information and ingenuity as they see fit in order to solve the problems that arise on the floor (see, e.g., Ichniowski and Shaw 2003). Efficiency wage arguments suggest that high wage levels are one complementary factor in HPWS. For example, Osterman (2006) argues that modern systems of work organization "require employees to contribute ideas and effort to a greater extent than traditional systems, and the question facing the firm is how to induce this contribution. Paying higher wages […] is in effect an efficiency wage strategy that may make sense" (p. 190). The empirical results on the association between HPWS and higher wage levels, however, are mixed (e.g., Handel and Levine 2004, Osterman 2006). This could be due to the fact that the intangible rewards of HPWS serve as substitutes for wage payments. Theories of employee empowerment or involvement (Thomas and Velthouse 1990, Cotton 1993) suggest that "jobs with more autonomy may reduce the disutility of effort, in part because employees find it less onerous to perform a job they have helped design" (Handel and Levine 2004, p. 6). A given wage level might thus be perceived as an "efficiency wage" under HPWS but not under traditional systems as workers are more satisfied and need less compensation to accept jobs under HPWS. Our experimental results suggest that granting decision rights to workers is valued as such. The intrinsic value of decision rights might thus also explain the missing link between HPWS and wage levels. Suggestive evidence in favor of this hypothesis has previously been found in studies of individuals who follow career paths that give them more autonomy in what they do. Hamilton (2000) shows that entrepreneurs effectively forego earnings for their self-employment, which is also true for scientists (see Stern 2004).

The remainder of the paper is organized as follows. Section 2 outlines the experimental design for measuring the intrinsic value of decision rights in detail. Section 3 presents the theoretical framework behind our experimental design. Here we demonstrate that our measure of the intrinsic value of decision rights does not only take their instrumental value into account, but also the principals' risk and social preferences and ambiguity aversion. Section 4 reports the experimental results. Section 5 discusses potential alternative explanations of our results. Section 6 concludes.

2. Experimental Design

Our elicitation method is designed to measure an individuals' intrinsic value of decision rights. We first collect the principals' choices in a *delegation game*, and later elicit their evaluations of the consequences of these choices in a neutrally framed *lottery task*.

In the delegation game, a principal can either keep a decision right or delegate it to an agent. The owner of the decision right can first determine the project alternative and second the level of the implementation effort. There is a conflict of interest between the principal and the agent regarding the project alternative, and the costly implementation effort determines the probability with which the project will be successful. Both parties ultimately receive payoffs depending on the chosen alternative and success of the project.

To answer the question whether decision rights have an intrinsic value, it is crucial to control for their instrumental value. We cannot achieve this objective if our delegation game is played in its basic extensive form, where the principal either delegates or not, and the player with the decision right then determines the project alternative and the probability of success. The reason is that the delegation choice depends on the principal's unobserved belief about the agent's subsequent choices, and on the principal's unobserved risk preferences, social preferences, and possible ambiguity aversion. To isolate the intrinsic value component of the decision right, we have to control for these beliefs and preferences because they determine the instrumental value of the decision right. Instead of conducting the basic extensive form of the delegation game, we therefore elicit a principal's point of indifference between keeping and delegating the decision right: The principal has to choose a minimum requirement for the agent's implementation effort, based on which the decision right is either delegated or not. In particular, if the agent's actual effort is above (or equal to) the minimum requirement, delegation takes place, while the principal keeps the decision right if it is below the minimum requirement. We show in Section 3 that the principal's optimal choice of the minimum effort requirement determines an agent's effort level, at which the principal is indifferent between keeping and delegating the decision right. The important feature of this design is that the point of indifference (i.e. the optimal minimum requirement) incorporates all of the principal's preferences and is independent of the principal's beliefs about the agent's effort. This implies that our method of measuring the intrinsic value component of the decision right controls for the principal's preferences and beliefs. We provide this rationale for the key design features at this early point in the paper because the reader might otherwise wonder why we chose the experimental design that we describe below in detail. We also formally show that our elicitation mechanism is incentive compatible in Section 3, and that it controls for the principal's beliefs and preferences and thereby for the instrumental value of the decision right.

2.1 Part 1: The Delegation Game

In Part 1 of the experiment we implement a one-shot delegation game, in which a principal (she) faces an agent (he). Initially, the principal holds the decision right, which grants the right to implement a project, the outcome of which not only affects the principal's payoff, but that of the agent as well. The implementation of a project involves making two decisions: the choice between two possible project alternatives and the determination of the probability of success of the project. In total, the subjects participate in 10 different delegation games ("rounds").

2.1.1 The Choice of the Project Alternative

A project can be implemented in one of two alternatives: alternative $\mathcal{P}$ or alternative $\mathcal{A}$. The successful implementation of the project generates a private monetary payoff that depends on the chosen alternative. The payoffs are denoted by $P_{\mathcal{P}}$ or $P_{\mathcal{A}}$ for the principal and by $A_{\mathcal{P}}$ or $A_{\mathcal{A}}$ for the agent, where subscripts indicate the chosen project alternative. If the project implementation is not successful, the principal and the agent receive an outside payoff of P_0 and A_0, respectively. The principal weakly prefers alternative $\mathcal{P}$ over alternative $\mathcal{A}$, and the agent weakly prefers alternative $\mathcal{A}$ over alternative $\mathcal{P}$. Independent of the alternative, a successful implementation is always preferred to an unsuccessful implementation. We thus have $P_{\mathcal{P}} \geq P_{\mathcal{A}} > P_0$ and $A_{\mathcal{A}} \geq A_{\mathcal{P}} > A_0$. The exact project payoffs differ across rounds of Part 1 of the experiment but they are always common knowledge. Before the principal and agent know who will ultimately hold the decision right in a given round, both indicate privately their *intended choice of the project alternative*, and this choice is binding for the player who ultimately holds the decision right. The intended chosen alternative of the player without decision right will not be relevant, and is unobservable for the other player.

2.1.2 The Determination of the Probability of Success of the Project

The player with the decision right not only chooses the project alternative but also the probability of success of the project. The "effort" level —a chosen number—that the player with the decision right devotes to the project determines the probability of success. Effort can be chosen from the set $\{0,1,\ldots,99,100\}$ and corresponds to the percent probability that the project will be successful. The cost of effort is given by $C(E) = k \cdot E^2$ and $C(e) = k \cdot e^2$, for the principal and the agent, respectively, where E denotes the principal's effort choice, e the agent's effort choice, and $k \in \{0.01,0.02\}$ is a cost parameter. The cost parameter k varies across rounds but it is always common knowledge and identical for the principal and the agent.[4] As with the choice of the alternative, before principals and agents know who will implement the project in a given round, both indicate their *intended effort level*. This choice is binding for the player who ultimately holds the decision right, and only this player will bear the corresponding cost of effort. The other player's intended effort level will not be executed and no effort costs arise for this player. The other player neither observes the intended nor the actual effort choices.

2.1.3 The Delegation Decision

In our game, initially the principal always has the right to choose the project alternative and to determine the probability of success. Instead of keeping the decision right, the principal can delegate it to the agent. The principal's delegation decision is contingent on the agent's intended

[4] In the instructions to the participants, both cost functions are presented in a table that displays all possible effort levels and their associated costs. In addition, the instructions contained graphs illustrating the cost functions.

effort choice based on a *minimum effort requirement* $\underline{e} \in \{1, \ldots, 99, 100\}$.[5] Delegation takes place if and only if the agent's intended effort level e is at least as high as the principal's minimum effort requirement $\underline{e}$. Importantly, the principal does not know the agent's intended effort choice when she sets the minimum requirement. Likewise, the agent does not know the principal's effort requirement.

2.1.4 The Payoff Functions

Under the assumption that each player chooses the project alternative that maximizes his or her own monetary payoff,[6] a principal's monetary payoff function is given by $\mathrm{E} \cdot P_{\mathcal{P}} + (1 - E) \cdot P_0 - C(E)$ in case she keeps the decision right and by $\mathrm{e} \cdot P_{\mathcal{A}} + (1 - e) \cdot P_0$ in case she delegates. Equivalently, the agent's monetary payoff function is given by $\mathrm{e} \cdot A_{\mathcal{A}} + (1 - e) \cdot A_0 - C(e)$ in case the principal delegates and by $\mathrm{E} \cdot A_{\mathcal{A}} + (1 - E) \cdot A_0$ in case the principal keeps the decision right.

2.1.5 The Order of Events in the Delegation Game

The order of the events in the delegation game is shown in Figure 1. First, the agent chooses an intended project alternative and effort level in case he receives the decision right. Both decisions are binding should delegation take place. Second, the principal chooses the minimum agent effort conditional on which she will delegate the decision right. The principal sets the minimum requirement without knowing the agent's intended effort choice.[7] Third, before the principal learns whether the agent's intended effort choice matches the minimum requirement, the principal chooses an intended effort level and project alternative for the case in which she retains the decision right. Both decisions are binding should this case materialize.[8]

[5] We did not allow for a minimum effort requirement of 0 to ensure a minimal probability of non-delegation, such that the principal's effort choice for non-delegation is incentive compatible.
[6] The subjects chose the alternative with the higher monetary payoff for themselves in 97.8 percent of the cases.
[7] The principal is also not informed about the agent's choice of the alternative, but the subjects almost always chose the project alternative with the higher monetary payoff for themselves (see footnote 6).
[8] To control for potential order effects, we reversed the order of events in one session so that principals choose their intended effort level and project alternative before determining the minimum requirement for the agent's effort choice. We do not find significant differences in mean effort choices (p=0.61, two-sample t-test) and mean

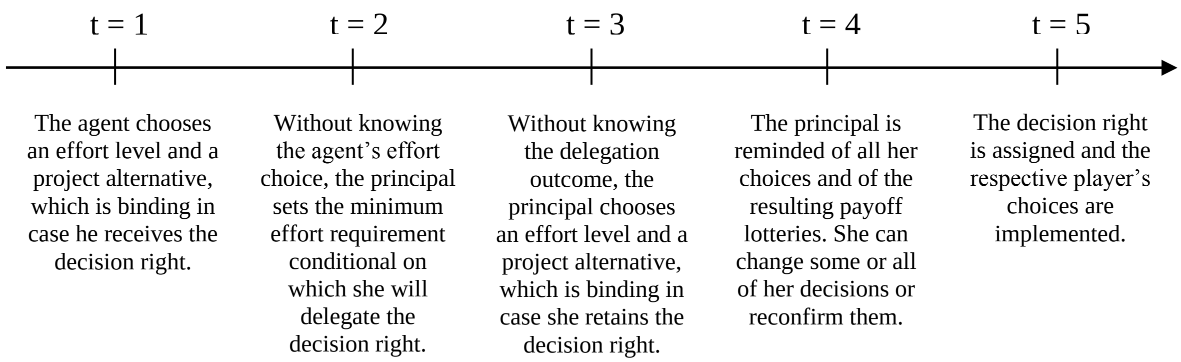

Figure 1: The Order of Events in the Delegation Game.

Next, to ensure that the principals are fully aware of the consequences of all their choices, each principal is reminded of all her choices in the given round. Each principal is explicitly shown the payoff lottery that results for her and for the agent in case she retains the decision right. The principal's effort choice, her corresponding effort cost, and the chosen project alternative fully determine this lottery. Each principal is also shown a lottery that results for her and for the agent in case she does not retain the decision right. For this case, among all possible lotteries, the lottery with the lowest expected payoff for the principal is shown: the lottery that results if the agent's effort choice matches *exactly* the minimum effort requirement and if the agent chooses project alternative $\mathcal{A}$. In all other instances of delegation, the agent either chooses a higher effort, which results in a higher probability of a successful project implementation, or the principal's preferred project alternative $\mathcal{P}$, or both. The principals are then given the opportunity to either change some or all of their choices or to reconfirm them.

Finally, the principal's minimum requirement and the agent's intended effort choice are compared to determine whether the decision right is delegated or not, and the decisions of the party who then holds the decision right are implemented. The participants receive no feedback about the outcomes in a given round until the end of the experiment.

minimum requirements (p=0.70, two-sample t-test), and therefore pool the data from all sessions in the subsequent analysis.

2.1.6 The Parameters in the Different Rounds of the Delegation Game

The delegation game is played repeatedly with a perfect stranger matching for 10 rounds. Subjects remain in the role of the principal or the agent throughout the experiment. The ten rounds differ only with regard to the payoffs in alternative $\mathcal{P}$ and alternative $\mathcal{A}$ of the project and with regard to the cost of effort. The different parameterizations are implemented to test the robustness of an intrinsic value component of decision rights across different games as well as to test potential situational determinants of this value component. Table 1 gives an overview of the payoffs in each game. The order of the ten different games was randomized across sessions.

	Project successful				Project unsuccessful				
	Alternative $\mathcal{P}$		Alternative $\mathcal{A}$		both alternatives				
	Principal	**Agent**	**Principal**	**Agent**	**Principal**	**Agent**	$\boldsymbol{k}$	$\boldsymbol{E^*}$	$\underline{\boldsymbol{e}}^*$
Game 1	220	190	190	220	100	100	0.01	60	40
Game 2	280	235	235	280	100	100	0.01	90	60
Game 3	180	140	140	180	100	100	0.01	40	40
Game 4	220	160	160	220	100	100	0.01	60	60
Game 5	260	260	260	260	100	100	0.01	80	40
Game 6	440	380	380	440	200	200	0.02	60	40
Game 7	560	470	470	560	200	200	0.02	90	60
Game 8	360	280	280	360	200	200	0.02	40	40
Game 9	440	320	320	440	200	200	0.02	60	60
Game 10	520	520	520	520	200	200	0.02	80	40

Table 1: The table shows the project payoffs in experimental points for principals and agents, and the corresponding cost parameter k. It also shows the principals' optimal effort choices, E^*, and the optimal minimum effort requirements, $\underline{e}^*$ that result under the assumption of risk-neutral and selfish preferences, and the absence of an intrinsic value component of decision rights.

The parameters of the 10 games differ systematically with respect to two dimensions. First, the payoffs in games 6 to 10 are exactly twice as high as those in games 1 to 5. We thus systematically vary the *stake size*. We hypothesize that the intrinsic value of a decision right is not a fixed monetary amount but that it scales with the stake size of the decision.

Second, the games vary the relative monetary difference for the principal and the agent between alternative $\mathcal{P}$ and alternative $\mathcal{A}$ in case of success. We thus systematically vary the *conflict of interest* between the principal and the agent with respect to the project alternative. We hypothesize that conflict between the involved parties is a potential driving factor of the intrinsic value of decision rights. This hypothesis is motivated by debates about the definition of power in the political science literature. While some scholars define power simply as being "able to make, or able to receive, any change" (Locke 1975[1690], p. 111), others postulate that these choices must affect another party with conflicting interests to constitute power (Dahl 1957, Polsby 1963). The systematic variation of the payoffs across the different games allows us to analyze how the intrinsic value of decision rights changes when conflict of interest changes, or when there is no conflict of interest in the choice of the alternative at all.

To exemplify the parameters of the different games, Table 1 also displays the optimal values for E and $\underline{e}$ in each game, under the assumption of selfish and risk-neutral preferences, and assuming no intrinsic value of the decision right. Recall that the payoffs and effort costs in Games 6 to 10 are exactly twice as high as those in Games 1 to 5. The predictions for E and $\underline{e}$ thus coincide.

At the end of the experiment, one of the 10 rounds in Part 1 is randomly chosen to be relevant for payment. The player who holds the decision right is given the opportunity to roll two ten-sided dice to determine whether the chosen project alternative is successful or not (unless the relevant effort level is either 0 or 100, in which case the project outcome is certain). The two ten-sided dice generate numbers between 1 and 100. If this number is below or equal to the chosen percent probability for the project success, then the project is successful. Full feedback about the resulting payoffs in this round is then given to both players.

2.2 Part 2: The Lottery Task

We implement a simple individual decision task in Part 2 of our experiment. Each participant states his or her certainty equivalents for 20 different lotteries. Each lottery determines probabilistically the principal's own payoff and the payoff of another, randomly paired participant. These 20 lotteries are determined by a principal's own choices in the 10 rounds of the preceding delegation game. [9] In each round of the delegation game, a principal's choice of E, $\underline{e}$, and the project alternative defines a pair of lotteries: a *control lottery* and a *delegation lottery*.[10] A principal's effort choice, her corresponding effort costs, and the chosen project alternative fully determine a control lottery. The minimum effort requirement fully determines a delegation lottery. By definition, the latter occurs if an agent chooses exactly the principal's minimum effort requirement, incurs the associated effort cost, and chooses project alternative $\mathcal{A}$.

For example, assume that a principal chooses an effort level of $E = 50$ (with an associated effort cost of 25), alternative $\mathcal{P}$, and a minimum effort requirement of $\underline{e} = 40$ (with an associated effort cost of 16 for the agent) in Game 1 of Part 1 of the experiment (see Table 1). These choices imply the following two lotteries over the own and another participant's payoff:

- *Control Lottery*: The principal receives $220 - 25 = 195$ experimental points and the agent receives 190 points with a probability of 0.5, and the principal receives $100 - 25 = 75$ points and the agent receives 100 points with a probability of 0.5.
- *Delegation Lottery*: The principal receives 190 points and the agent receives $220 - 16 = 204$ points with a probability of 0.4, and the principal receives 100 points and the agent receives $100 - 16 = 84$ points with a probability of 0.6.

Importantly, the control lottery and the delegation lottery are *neutrally framed* in the lottery task, i.e., there is neither a context nor a connection to Part 1 of the experiment. In particular, we do not inform the principals that the 20 lotteries that they face in Part 2 are derived from their own choices in Part 1. Furthermore, we do not indicate which lotteries form a pair (one control and one delegation lottery) derived from a principal's choices in a given round of the delegation

[9] Here we refer to participants who are in the role of a principal in Part 1 of the experiment as "principals" and to the other participants as "agents" for expositional reasons only. In the instructions to Part 2, participants are not called principals and agents; each participant is simply referred to as "you", and a matched participant whose payoff might be affected by one's own choice is referred to as a "random other participant."

[10] In the participants' instructions to Part 2, the 20 lotteries are not labeled in this way, nor are they distinguished in any other way. We introduce these terms in this paper for expositional reasons only.

game. The principals simply face each of the 20 lotteries in an individually randomized order and specify their certainty equivalent for each neutrally framed payoff lottery.[11]

To elicit the participants' certainty equivalents, we use an incentive compatible mechanism first introduced by Becker, DeGroot and Marschak (1964). For every lottery, a participant has to indicate the certain payoff—the certainty equivalent—that she or he demands in order to be willing to accept the certain payoff instead of the lottery. A computerized random mechanism then determines the certain payoff actually offered to the participant. The offered certain payoff is drawn from a uniform distribution, where the bounds of the distribution are given by the two possible lottery payoffs for the participant. In the example of the control lottery above, the participant's actual certain payoff is thus uniformly distributed between 75 and 195 points. If the actually offered certain payoff is at least as high as the stated certainty equivalent, the participant receives the actual certain payoff and the lottery is not played in this case. If the actual certain payoff is below the stated certainty equivalent, the lottery is played. If the certain payoff is accepted, the random other participant also receives a fixed payoff. In the lotteries derived from the choices in games 1 to 5, the random other participant's fixed payment is 100 points, while the random other participant's fixed payment is 200 points in the lotteries that are derived from the choices in games 6 to 10. These payoffs match those of the projects in Part 1 in case of failure.

At the end of the experiment, two of the 20 lotteries are randomly chosen to be relevant for payment.[12] Each participant is given feedback about the size of the actually offered certain payoff for these lotteries. In case the actually offered certain payoff exceeds the participant's demanded certainty equivalent, the participant receives the offered certain payoff, i.e. the lottery is not played out. In case a participant's demanded certainty equivalent exceeds the actually offered certain payoff, the lottery is played out. The participant is then given the opportunity to

[11] We are only interested in the principals' stated certainty equivalents and collect choices from the agents simply to keep them busy during Part 2 of the experiment.

[12] Selecting two lotteries for payment guarantees that the expected value (in CHF) of one experimental point in the lottery task is equal to the expected value (in CHF) of one point in the delegation game.

roll two ten-sided dice to determine the lottery outcome (unless the lottery was degenerate, in which case no uncertainty has to be resolved). Feedback is then given to all participants.[13]

2.3 Further experimental measurements

Subsequent to Part 1 and 2, further individual measures are taken. First, we elicit a participant's loss aversion. Second, we measure a participant's illusion of control. We collect these additional measures to analyze possible alternative explanations for the possible difference in certainty equivalents in Part 2. The additional measures are described in more detail in Section 5.

2.4 Procedures

We conducted three sessions with a total of 104 participants in October 2011 and two additional control sessions with a total of 68 subjects in November 2012 at the computer laboratory of the Department of Economics at the University of Zurich. The subject pool consisted primarily of students at the University of Zurich and the Swiss Federal Institute of Technology in Zurich. The experiments were computerized using the software Z-Tree (Fischbacher 2007) and the recruitment was done with the software ORSEE (Greiner 2004). An experimental session lasted 2 to 3 hours.

The participants were provided with written instructions and—in the first two parts of the experiment—had to answer control questions to guarantee their understanding of the instructions. Instructions for the lottery task in Part 2 of the experiment were handed out only after the delegation game in Part 1 was finished. Participants knew that the experimental session would consist of several parts, but they did not know the content of the future parts before the respective instructions were provided. The instructions for the loss aversion task were presented on a computer screen; the instructions for the illusion of control task were paper based.

[13] In Part 2, each participant also assumed the role of the "random other participant" in two randomly chosen lotteries and was paid according to the respective matched participant's choices. The participants were only informed about these additional earnings at the end of the experiment. Our matching algorithm ensured that no participant was matched with another participant more than once in Part 2.

Payments were made for one randomly drawn round of the delegation game and for four randomly drawn lotteries in Part 2 (two of them in the role of the "random other participant;" see footnote 13). Subjects received additional payments in the loss aversion and illusion of control tasks. 100 experimental points were converted into 6 CHF, which resulted in an average payment of 75 CHF ($80.00 at the time of the experiment), including a 10 CHF show-up fee.

3. Theoretical Framework

In this section, we formally develop the theoretical framework behind our experimental design. We allow for the possibility that the assignment of a decision right intrinsically affects a player's utility, and we demonstrate that our measure of the intrinsic value of decision rights not only controls for the decision right's instrumental value, but for the principals' risk preferences, social preferences, and ambiguity aversion as well.

Let a player's utility function over certain payoffs be written as $u(x, y, \delta)$, where x denotes own payoff, y denotes the payoff of another party, and δ denotes whether or not an individual has the decision right. Let $\delta = 1$ denote that a player has the decision right, and let $\delta = 0$ denote that another player has the decision right. The case where no decision rights are present is denoted by $\delta = \emptyset$. An example for such a case is the neutrally framed Part 2 of our experiment, where subjects individually value lotteries. Let the utility function of a player over uncertain outcomes be denoted by $U(L, \delta)$, where L denotes the lottery that reflects the payoffs of all players affected by the lottery as well as the probabilities of the different payoffs.

Principals derive utility from a lottery over monetary outcomes and potentially from having the decision right. In Part 1 of our experimental design, the lotteries over monetary outcomes result from the intended effort choice, the minimum effort requirement, and from the players' preferred project alternatives. The key feature of our design is that we can directly control for the principals' individual risk preferences, social preferences, and ambiguity aversion because the choices of E and $\underline{e}$ reveal the point of indifference between keeping and delegating the decision right.

In the *control lottery*, let $x = \begin{pmatrix} P_{\mathcal{P}} - C(E) \\ P_0 - C(E) \end{pmatrix}$ denote the vector of monetary outcomes for the principal and let $y = \begin{pmatrix} A_{\mathcal{P}} \\ A_0 \end{pmatrix}$ denote the vector of monetary outcomes for the agent. In the *delegation lottery*, $x' = \begin{pmatrix} P_{\mathcal{A}} \\ P_0 \end{pmatrix}$ denotes the vector of monetary outcomes for the principal and $y' = \begin{pmatrix} A_{\mathcal{A}} - C(\underline{e}) \\ A_0 - C(\underline{e}) \end{pmatrix}$ denotes the vector of monetary outcomes for the agent. The probability of success is denoted by E and $\underline{e}$ in the respective lotteries.[14]

Remember that the agent is not restricted to the choice of $\underline{e}$, which is solely the minimum effort requirement. The decision right is delegated to the agent whenever he chooses $e \geq \underline{e}$. Moreover, the principal cannot condition the delegation of the decision right on the agent's choice of the project alternative. While it is plausible to assume that the agent will choose project alternative $\mathcal{A}$, the agent could also choose alternative $\mathcal{P}$. We therefore need to impose some structure on the principal's utility function. In particular, we assume that the principal's expected utility is non-decreasing, first, in the agent's effort level and, second, if the agent chooses project alternative $\mathcal{P}$ rather than alternative $\mathcal{A}$:

Assumption 1: $$\frac{\partial U(x', y', e | \delta = 0)}{\partial e} \geq 0$$

Assumption 2: $$U(\hat{x}, \hat{y}, e | \delta = 0) \geq U(x', y', e | \delta = 0)$$

where $\hat{x} = \begin{pmatrix} P_{\mathcal{P}} \\ P_0 \end{pmatrix}$ denotes the vector of monetary outcomes for the principal and $\hat{y} = \begin{pmatrix} A_{\mathcal{P}} - C(\underline{e}) \\ A_0 - C(\underline{e}) \end{pmatrix}$ denotes the vector of monetary outcomes for the agent, given that delegation takes place and the agent chooses project alternative $\mathcal{P}$.

[14] This assumes that the players chose the alternative with the higher own monetary payoff. If, for example, the principal chooses alternative $\mathcal{A}$, x and y are given by $x = \begin{pmatrix} P_{\mathcal{A}} - C(E) \\ P_0 - C(E) \end{pmatrix}$ and $y = \begin{pmatrix} A_{\mathcal{A}} \\ A_0 \end{pmatrix}$.

Both assumptions are reasonable: A higher e increases the probability that the project will be successful, which increases the principal's expected monetary payoff. The same holds if the agent chooses project alternative $\mathcal{P}$ rather than $\mathcal{A}$. A purely self-interested principal thus clearly prefers a higher e and/or project alternative $\mathcal{P}$, independent of her risk preferences. Moreover, Assumptions 1 and 2 are not in conflict with any kind of social preferences where the principal's expected utility is non-decreasing when the higher of her two possible lottery payoffs becomes either more likely or if that payoff increases—while at the same time the agent's utility is maximized by revealed choice.

Note finally that assumptions 1 and 2 imply that $U(x', y', \underline{e}|\delta = 0)$ constitutes the lowest expected utility level that can arise for the principal in case of delegation. The ambiguity that still exists with regard to the agent's actions cannot hurt the principal. If anything, she will be better off than in the delegation lottery in which the agent chooses effort level $\underline{e}$ and project alternative $\mathcal{A}$. Hence, even if the principal is ambiguity-averse, Assumptions 1 and 2 imply that the principal's overall utility level after delegation is at least as high as $U(x', y', \underline{e}|\delta = 0)$.

Given Assumptions 1 and 2, it is optimal for the principal to choose $\underline{e}$ such that the expected utility after delegation is at least as high as the expected utility when she keeps the decision right.[15] Therefore, the principal will choose $\underline{e}$ such that the utility of the control lottery $U(x, y, E|\delta = 1)$ equals the utility of the delegation lottery $U(x', y', \underline{e}|\delta = 0)$:

$$U(x, y, E|\delta = 1) = U(x', y', \underline{e}|\delta = 0) \quad (5)$$

Given Assumption 1, equation (5) has a unique solution if $U(x, y, E|\delta = 1) > U(x', y', 1|\delta = 0)$ and $U(x, y, E|\delta = 1) < U(x', y', 100|\delta = 0)$. If $U(x, y, E|\delta = 1) < U(x', y', 1|\delta = 0)$, the principal will always want to delegate and therefore chooses the lowest possible $\underline{e}$. For example, this delegation strategy could be rational for a very risk or loss averse principal when the

[15] While we argue that Assumption 1 is reasonable, it may not always be satisfied. For example, while increasing e always increases the principals' expected payoff, it may also increase positive or negative inequality. An inequity-averse principal's preferences might therefore violate Assumption 1. However, as long as the solution to equation (5) is unique and the marginal utility of the principal in e is positive at $\underline{e}$, a principal still truthfully reveals her point of indifference. For more unreasonable cases in which the solution to equation (5) is not unique, however, our mechanism may fail to truthfully elicit the point of indifference between keeping and delegating the decision right.

difference between x and x' is very small. If $U(x, y, E|\delta = 1) > U(x', y', 100|\delta = 0)$, the principal will never want to delegate and therefore choose the highest possible $\underline{e}$.[16]

We want to test the null hypothesis that the decision right has *per se* no impact on a player's utility. If this is the case, the utility function is independent of δ:

$$U(L|\delta = 1) = U(L|\delta = 0) = U(L|\delta = \emptyset) = U(L) \tag{6}$$

For all 20 lotteries, there are certainty equivalents which yield the same utility as the lottery:

$$U(x, y, E) = u(CE(x, y, E)) \tag{7}$$

$$U(x', y', \underline{e}) = u(CE(x', y', \underline{e})) \tag{8}$$

Hence, if no intrinsic value component of the decision right exists, the following holds:

$$u(CE(x, y, E)) = u(CE(x', y', \underline{e})) \tag{9}$$

$$CE(x, y, E) = CE(x', y', \underline{e}) \tag{10}$$

The principal should thus be indifferent between the neutrally framed *control lottery* and the neutrally framed *delegation lottery*. In other words, the pairs of certainty equivalents relating to these pairs of neutrally framed lotteries should then be identical in each of the 10 games in Part 1 of the experiment. If we find significant differences in these pairs of certainty equivalents, this would show that holding the decision right has an intrinsic impact on utility in the delegation game. Based on this theoretical framework, we will use our experimental data to test the following null hypothesis.

[16] It might be possible that a principal still assigns a higher value to the delegation lottery than to the control lottery if she chooses $\underline{e} = 1$. In this case, a principal might even be willing to pay in order to delegate – on top of accepting a lottery in which an agent chooses e = 1. Our elicitation method fails to capture the potential residual value difference between the delegation and the control lottery that may occur if $\underline{e} = 1$. Therefore, we may overestimate the *average* intrinsic value of decision rights. Equivalently, a principal might still assign a higher value to the control lottery than to the delegation lottery if she chooses $\underline{e} = 100$, which might lead to an underestimation of the *average* intrinsic value of decision rights. In our experiment, $\underline{e} = 100$ was chosen only in 1.9% of the cases, and $\underline{e} = 1$ was chosen in 15.8% of the cases. In the Appendix, we present evidence from a control treatment that shows that in those cases where $\underline{e} = 1$ a residual value difference almost never exists.

Hypothesis: *In the lottery task in Part 2 of the experiment, there is no difference in the certainty equivalents of the neutrally framed control lottery and the neutrally framed delegation lottery, which were determined in the delegation game in Part 1. The decision right thus has no intrinsic value component.*

To further analyze the potential intrinsic impact of decision rights on utility, we define the control premium as the monetary measure of the principal's intrinsic utility from possessing the decision right. Intuitively, the control premium measures the certain monetary amount that a principal demands as a compensation for the transfer of the decision right to the agent.

The expected utility associated with the control lottery is given by $U(x, y, E|\delta = 1)$. The certainty equivalent that yields the same utility when the principal has the decision right is given by $CE(x, y, E|\delta = 1)$. It follows that[17]

$$U(x, y, E|\delta = 1) = u[CE(x, y, E|\delta = 1)|\delta = 1]. \tag{11}$$

We now define the monetary value $MV_{\delta=1}$ of the principal's intrinsic utility derived from the decision right, relative to a benchmark where decision rights are absent. $CE(x, y, E|\delta = \emptyset)$ denotes the certainty equivalent of a neutrally framed lottery that is exactly identical in monetary terms to the control lottery. This is precisely the certainty equivalent that we elicit in the lottery task in Part 2 of the experiment. This certainty equivalent differs in an important aspect from $CE(x, y, E|\delta = 1)$, since it abstracts from the potential intrinsic value component of having the decision right. To account for this potential difference, we introduce the term $MV_{\delta=1}$ which denotes the compensation in terms of certain income required to keep utility constant when moving from the control lottery that involves having the decision right to the neutrally framed control lottery. In other words, $MV_{\delta=1}$ measures the principal's loss of intrinsic value associated with the loss of the decision right. It follows that

[17] When the principal chooses the certainty equivalent, the agent gets a payoff of 100 or 200 points, depending on the delegation game. Hence, the fully specified utility function when the principal chooses the certainty equivalent is, for example, given by $u[CE(x, y, E|\delta = 1)|\delta = 1; 100]$, where the first entry denotes the payoff to the principal and the second entry the payoff to the agent. Since the payoff to the agent is always either 100 or 200 whenever the certainty equivalent is chosen, we omit his payoff from the notation for reasons of simplicity.

$$u[CE(x,y,E|\delta=1)|\delta=1]=u[CE(x,y,E|\delta=\emptyset)+MV_{\delta=1}|\delta=\emptyset]. \tag{12}$$

We can repeat this exercise for the expected utility of the principal in the delegation lottery:

$$U(x',y',\underline{e}|\delta=0)=u[CE(x',y',\underline{e}|\delta=0)|\delta=0]$$

$$=u[CE(x',y',\underline{e}|\delta=\emptyset)+MV_{\delta=0}|\delta=\emptyset] \tag{13}$$

In equation (13), $MV_{\delta=0}$ is defined as the compensation in terms of certain income that is required to keep utility constant when moving from the delegation lottery, where a player does not hold the decision right, to the neutrally framed delegation lottery, presented in a context without decision rights. $MV_{\delta=0}$ therefore measures the (possibly negative) gain of intrinsic value associated with being in a subordinate position.

What is the principal's overall loss of intrinsic value from transferring the decision right to the agent? In case of a transfer, the principal gives up an intrinsic value of $MV_{\delta=1}$ and receives a (possibly negative) intrinsic value of $MV_{\delta=0}$.[18] The principal's overall loss of intrinsic value is, therefore, given by the difference between $MV_{\delta=1}$ and $MV_{\delta=0}$.

How can we measure this overall loss empirically? We know by revealed preference that

$$U(x,y,E|\delta=1)=U(x',y',\underline{e}|\delta=0) \tag{14}$$

Given the transformations made in equations (12) and (13), this implies that

$$u[CE(x,y,E|\delta=\emptyset)+MV_{\delta=1}|\delta=\emptyset]=u[CE(x',y',\underline{e}|\delta=\emptyset)+MV_{\delta=0}|\delta=\emptyset] \tag{15}$$

From equation (15) follows that

$$CE(x,y,E|\delta=\emptyset)+MV_{\delta=1}=CE(x',y',\underline{e}|\delta=\emptyset)+MV_{\delta=0} \tag{16}$$

[18] Delegating the decision right in models in the spirit of Aghion and Tirole (1997) always implies being put in a "subordinate position," i.e. in a position where the agent's decisions determine the own payoff. Our experiment does not allow us to measure $MV_{\delta=1}$ and $MV_{\delta=0}$ separately; this could be done in future research, however. For example, an entrepreneur who faces the decision whether to sell his company or a CEO who faces a merger will potentially loose decision rights but is subsequently not necessarily in the role of a "subordinate."

$$MV_{\delta=1} - MV_{\delta=0} = CE(x', y', \underline{e}|\delta = \emptyset) - CE(x, y, E|\delta = \emptyset) \tag{17}$$

The difference in certainty equivalents between the neutrally framed delegation and control lotteries is a measure of the control premium the principal requires as a compensation for the transfer of the decision right.

4. Results

4.1 The Intrinsic Value of Decision Rights

Our theoretical framework allows us to test the null hypothesis that decision rights have no intrinsic value. If the null hypothesis is correct, we should observe that principals are indifferent between the neutrally framed control lottery and the corresponding neutrally framed delegation lottery. Our experimental data does not confirm the null hypothesis, which is summarized in the following:

> ***Result 1 (Intrinsic Value of Decision Rights):*** *On average, principals value decision rights intrinsically. The principals value the neutrally framed delegation lotteries significantly more highly than the equivalent, neutrally framed control lotteries. The average percentage difference in certainty equivalents amounts to 16.7 percent.*

Figure 2 shows each principal's average certainty equivalent of the neutrally framed control lotteries on the horizontal axis and each principal's average certainty equivalent of the neutrally framed delegation lotteries on the vertical axis. Each of the 69 dots in Figure 2 thus represents one principal.

If principals derive no intrinsic utility from decision rights, the average individual certainty equivalents of these lotteries should be equal and lie on the $45°$ line. It is evident from Figure 2, however, that the majority of observations lie above the $45°$ line. On average, the certainty equivalents of the neutrally framed delegation lotteries are 16.7 percent larger than those of the neutrally framed control lotteries. A one-sample t-test[19] shows that this percentage difference is significantly larger than zero (p<0.001). This indicates that, on average, the principals assign a positive intrinsic value to their decision right.

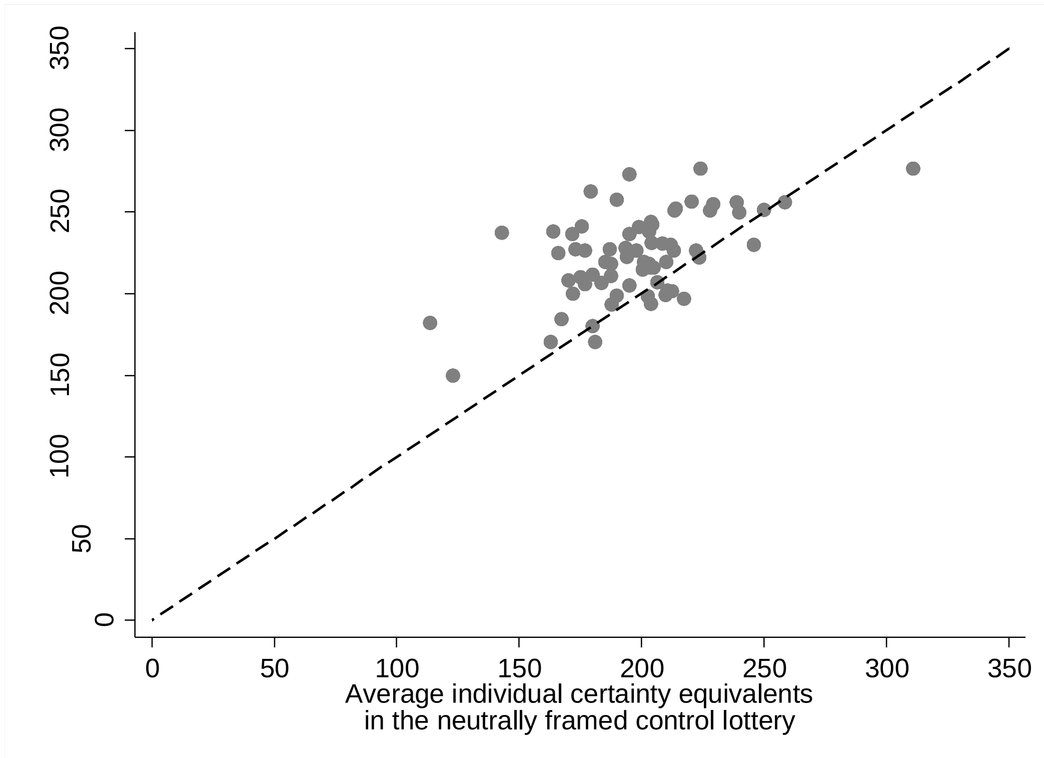

Figure 2: Individual principals' average certainty equivalents of the neutrally framed control lotteries and the neutrally framed delegation lotteries in experimental points. Each of the 69 dots represents one principal. The figure shows that most principals value the neutrally framed delegation lotteries on average higher than the neutrally framed control lotteries.

Figure 2 also reveals considerable individual heterogeneity in the intrinsic value of decision rights. The standard deviation in the average percentage difference between the certainty equivalents of the neutrally framed delegation and control lotteries is 15.6 percent. The large majority of principals assign positive intrinsic value to having decision rights, while this value is negative only for a minority. 83 percent of the principals assign on average higher certainty equivalents to the neutrally framed delegation lotteries, whereas 16 percent of the principals do the opposite. A non-parametric Wilcoxon signed-rank test rejects the hypothesis that principals

[19] We use the average percentage difference in certainty equivalents of each principal as one observation to perform the t-test. All reported p-values refer to two-sided tests.

value the neutrally framed delegation lotteries and the neutrally framed control lotteries equally (p<0.001).

To test the robustness of our main result, we analyze whether we consistently measure a positive intrinsic value of decision rights in all ten delegation games. Figure 3 shows the average percentage difference between principals' certainty equivalents of the neutrally framed delegation lotteries and the neutrally framed control lotteries for all ten delegation games. The figure shows that the principals assign higher certainty equivalents to the neutrally framed delegation lotteries in each of the 10 delegation games, and the difference is statistically significant at the 1 percent level in 9 out of 10 games in both a one-sample t-test and the Wilcoxon signed-rank test. Game 9 is significant at the 5 and 10 percent level only ($p = 0.02$, t-test and $p = 0.06$, Wilcoxon signed-rank test).[20]

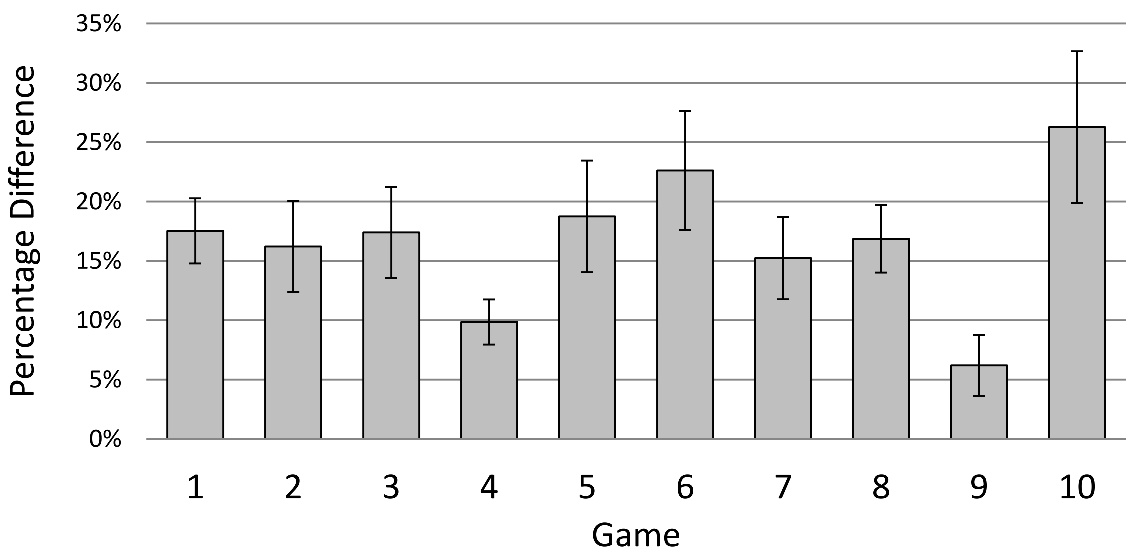

Figure 3: Average percentage difference between the certainty equivalents of the neutrally framed delegation lotteries and the neutrally framed control lotteries, sorted by delegation game. Bars display one standard deviation of the percentage difference.

This finding is summarized in the following result:

[20] We perform one-sample t-test for each of the ten games, using each principal's percentage difference between the certainty equivalent of the neutrally framed delegation lottery and the certainty equivalent of the neutrally framed control lottery as an observation.

Result 2 (Intrinsic Value of Decision Rights in the Separate Games): *The intrinsic value of decision rights is significantly positive in all ten delegation games.*

The observation that a positive intrinsic value of decision rights is not only found in most principals, but also across the different delegation games, lends support to the robustness of our finding.[21]

The elicitation of the certainty equivalents in Part 2 is time consuming and researchers interested in measuring the intrinsic value of a decision right may, therefore, want to rely on a simpler proxy measure in some environments. The expected values of the delegation and control lotteries generated in Part 1 may provide the basis for such a proxy measure. For this proxy to be useful, the expected monetary payoffs of the delegation and control lotteries determined in Part 1 should be highly correlated with the certainty equivalents elicited in Part 2. We find that this is indeed the case. The pair-wise correlation between a principal's expected payoff and the elicited certainty equivalent of a lottery is $\rho = 0.89$, which is highly significant ($p<0.001$). Moreover, our measure of the intrinsic value of decision rights (the difference in the certainty equivalents of the corresponding neutrally framed control and delegation lotteries) is positively correlated with the respective difference in the principal's expected payoffs of these two lotteries ($\rho = 0.58$, $p<0.001$).

Equivalent to Result 1, we find that the expected payoffs of the neutrally framed delegation lotteries are on average larger than the expected values of the neutrally framed control lotteries; the difference amounts to 7.1 percent. A one-sample t-test shows that this percentage difference is highly significant ($p<0.001$).[22] Moreover, the average difference in expected payoffs is positive for 82.6 percent of the principals, which is almost identical to the percentage of

[21] Further support for the robustness of our results can be found in one of the author's Ph.D. thesis. In Herz (2011), 12 delegation games (all with payoffs different from those in this paper) were used to elicit the intrinsic value of decision rights. The findings confirm the results presented here. The average percentage difference in certainty equivalents between the neutrally framed delegation and control lotteries is highly significant and amounts to 14.2 percent, a large and highly significant majority of 92 percent of principals (33 out of 36) positively values decision rights, and the finding is robust across all games (significantly so at the 1 or 5 percent level in 10 out of 12 games). The experimental design here amends the design reported in Herz (2011), especially with regard to their sequential structure, it varies the payoffs more systematically, e.g. with respect to the conflict of interest and the stake size of the decision, and it adds additional measures.

[22] To perform the t-test, we averaged the percentage differences in expected values for each principal.

principals (83 percent) who value decision rights positively when this value is measured on the basis of certainty equivalents (Wilcoxon signed-rank test, $p<0.001$).

Analogous to Result 2, we find that the principals' average expected payoffs in the neutrally framed delegation lotteries are larger than those in the neutrally framed control lotteries in all delegation games. These differences are significant at least at the 5 percent level for eight of the ten delegation games using one sample t-tests or Wilcoxon signed-rank tests.[23]

Finally, we analyze whether the intrinsic value of decision rights is measured consistently across principals in the ten delegation games. Consistency would require that if principal i assigns a higher intrinsic value to decision rights than principal j in one game, then principal i also assigns a higher value in the other games, i. e., that individual intrinsic values are correlated across games. One way to assess this consistency is to compute *Cronbach's alpha*, a concept frequently used in psychology and other social sciences as a measure of the internal validity of a psychometric test score (Cronbach, 1951). Cronbach's alpha measures the extent to which different items in questionnaires or—for our purposes—economic games measure the same latent variable. To measure this correlation, one could compute the correlation of the average intrinsic value of decision rights between the first five games and the last five games. Since this split is arbitrary, Cronbach's alpha is the mean of all possible split-half correlations of the games: Formally, $\text{Cronbach's alpha} = \frac{N}{N-1}\left(1 - \frac{\sum_{j=1}^{N} var(MV_j)}{var\sum_{j=1}^{N} MV_j}\right)$, where N is the number of games (10 in our case), $var(MV_j)$ is the variance in the intrinsic value of decision rights in the j-th game, and $var\sum_{j=1}^{N} MV_j$ is the variance of the sum of the intrinsic value of decision rights in the N games. Cronbach alpha thus measures the correlation between the games and it varies between zero and unity. We find that Cronbach alpha is equal to 0.62 when using differences in certainty equivalents, and equal to 0.77 when using differences in expected values as an approximate measure of the intrinsic value of decision rights. This suggests that our measures of the intrinsic value of decision rights in the ten games are positively correlated across principals. Regarding differences in certainty equivalents, however, the correlation is only moderately strong.

[23] In Games 5 and 9, the p-values are $p=0.31$ and $p=0.09$ for the t-tests; for the Wilcoxon signed-rank test, the p-values are $p= 0.50$ and $p=0.06$, respectively.

4.2 Situational Determinants of the Intrinsic Value of Decision Rights

In this subsection, we identify two situational determinants of the intrinsic value of decision rights. Figure 3 reveals that the intrinsic value varies across the ten different delegation games. This raises the question how situational characteristics, i.e., game specific factors, affect the intrinsic value of decision rights. Our experimental design enables us to consider two potential drivers: (i) the *stake size* and (ii) the *interest alignment* between the principal and the agent.

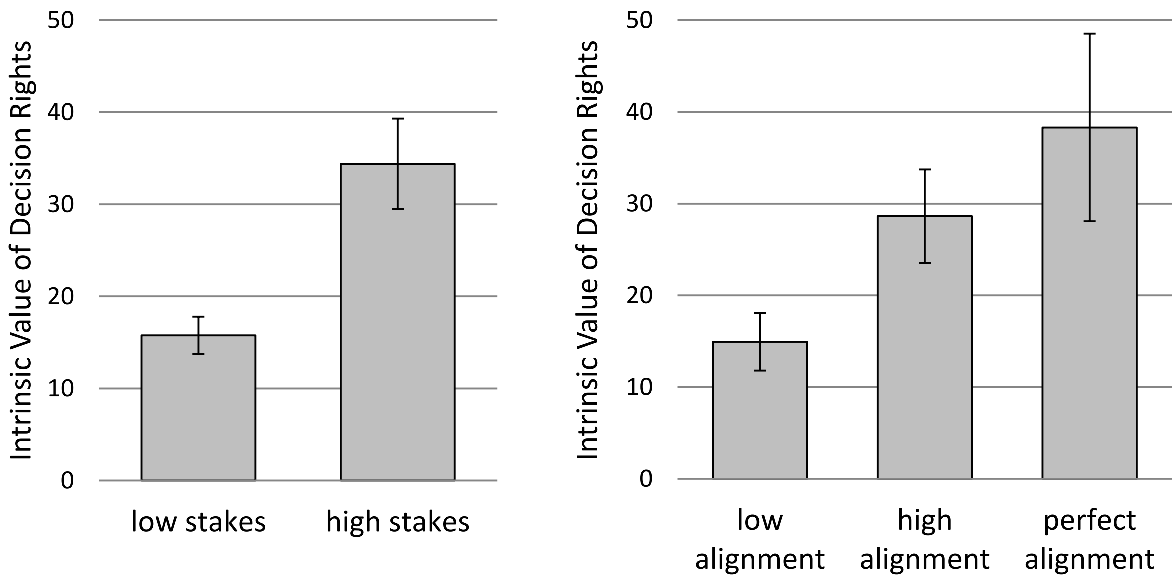

Figure 4: The left panel shows the average intrinsic value of decision rights by stake size. The right panel shows the average intrinsic value of decision rights by interest alignment. The bars display one standard deviation of the mean.

To analyze the impact of stake size on the intrinsic value of decision rights, we designed games 6 to 10 in such a way that they are equivalent to games 1 to 5 except for the fact that we doubled all payoffs, including the outside option and the effort costs. Games 1-5 are thus labeled "low stakes," whereas games 6-10 are labeled "high stakes." Interest alignment is defined as the principal's relative payoff difference between project alternatives $\mathcal{A}$ and $\mathcal{P}$, denoted as $\alpha = \frac{P_{\mathcal{A}} - P_0}{P_{\mathcal{P}} - P_0}$. Games 5 and 10 have a "perfect interest alignment" ($\alpha = 1$), games 1, 2, 6, and 7 have a "high interest alignment" ($\alpha = 0.75$), and games 3, 4, 8, and 9 have a "low interest alignment" ($\alpha = 0.5$).

The left panel of Figure 4 shows the average intrinsic values of decision rights for the two stake size levels. It can be seen that the decision right is valued about twice as highly in the high stakes games. The difference amounts to 18.6 experimental points and is statistically highly significant (paired t-test, $p<0.001$; Wilcoxon signed-rank test, $p<0.001$).[24] This suggests that the intrinsic value of decision rights is not simply a small, fixed value but that it scales with the stakes involved in the decision. This finding addresses the question about the external relevance of our experimental results. If the intrinsic value of decision rights were a fixed and relatively small amount, it might not be of importance in external, higher stakes environments. The finding that it scales with the stake size, however, suggests that the intrinsic value can be substantial and thus a relevant factor of influence in real world decision environments. This finding is summarized in the following result:

> ***Result 3 (Stake Size):*** *The intrinsic value of decision rights is not a fixed quantity but it scales with the monetary amounts at stake in the decision.*

The right panel of Figure 4 shows the average intrinsic values of decision rights for the different levels of interest alignment. Some political scientists (Dahl 1957, Polsby 1963, Lukes 2005) postulate that asymmetric interests between parties are a prerequisite for the existence of a power relationship. If individuals are motivated by a desire for control over another individual, and if the degree of power is increasing in conflict, we should observe that the intrinsic value of decision rights (granting power over another individual) should increase if the interest alignment between parties decreases.

Our data do not support this view, and in fact point in the opposite direction. Figure 4 shows that the intrinsic value of decision rights is higher, the higher the interest alignment. While the difference between the intrinsic values of decision rights is not statistically significantly different between high and perfect interest alignment, the intrinsic value is significantly smaller in the low interest alignment compared to both high and perfect alignment ($p<0.01$, respectively, using paired t-tests or Wilcoxon signed-rank tests). This is summarized in the following:

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[24] The intrinsic value is again first averaged for each principal before a paired t-test is performed.

Result 4 (Interest Alignment): *The intrinsic value of decision rights is higher, the higher the alignment of interest between the principal and the agent.*

One should remember that the *instrumental* value of decision rights is increasing in conflict of interest, since enforcing the own preferred choice becomes more important. The widely held intuition that individuals' value power, control, or decision rights particularly in situations in which there is conflict is therefore not necessarily wrong, but it is likely to be driven by its instrumental value. Our data suggests that the intrinsic value is decreasing as conflicts increase. A possible explanation for Result 4 is that making decisions that are also in the best interest of another person are "comfortable" decisions to make. Subjects may derive more self-esteem from successful implementation if their actions also did something good for another person. If, however, own actions impinge upon the interests of another person, these psychic benefits might be reduced. Our data do not allow us to pin down all the relevant and potentially contrarious situational determinants of the intrinsic value of decision rights.

Importantly, we do not want to argue in this paper that *all* decision rights are intrinsically valuable. For example, if decisions can lead to unfair outcomes, some people might prefer not to make such decisions. Bartling and Fischbacher (2012) provide experimental evidence that some subjects delegate the right to decide between a fair and an unfair monetary allocation to a subject with aligned monetary payoffs even if material incentives to delegate (such as the avoidance of punishment by the unfairly treated party) are absent. In future research, it would thus be interesting to disentangle the driving forces behind Result 4, and to learn more about the situational determinants of the intrinsic value of decision rights in general.

5. Discussion of Alternative Explanations

We attribute the identified differences in certainty equivalents to an intrinsic preference for decision rights, but are there alternative explanations? We showed already in Section 3 that risk and social preferences and ambiguity aversion cannot explain our results, because we controlled for these preference dimensions with the experimental design. In this section, we explore and discuss further potential alternative explanations.

5.1 Loss Aversion

Loss aversion (Kahneman and Tversky 1979) might be a *partial* explanation for the observed *size* of the difference in certainty equivalents. A principal initially holds the decision right, and parting with this right might be perceived as a loss. It is important to notice, however, that some *value* has to be present for a *loss* to be perceived. Hence, loss aversion cannot fully explain the difference in the certainty equivalents, but it might contribute to its size.

In the final part of the experiment, we therefore elicited an individual's degree of loss aversion using lottery tasks, where subjects had to accept or reject lotteries that involved possible losses of different sizes X.[25] The participants' decisions allow us to measure their loss aversion. The amount X at which a participant starts rejecting the lotteries is an indicator of his or her loss aversion. For example, a participant who rejects all lotteries with a potential loss of $X > 3$ is classified as more loss averse than a participant who only rejects all lotteries with a potential loss of $X > 5$.[26]

Our data do not show a correlation between a subject's average intrinsic value of decision rights and a subject's loss aversion measure ($\rho = 0.03; p = 0.81$). Our data therefore do not lend support to the possibility that the measured difference in the certainty equivalents is mainly a manifestation of the subjects' loss aversion.

[25] Each participant faces the same six lotteries that only affect the own payoff. Each participant decides for each lottery whether to accept it or not. Accepting involves a 50 percent chance of winning CHF 6 but a 50 percent chance of losing CHF X, where X takes on the six different values $X \in \{2,3,4,5,6,7\}$ in the six different lotteries. If a participant rejects a given lottery, he receives a payoff of CHF 0. One of the six lotteries is randomly selected for actual payment and—in case of acceptance —a computerized random move determines the outcome. The participants decide for each of the six lotteries whether to accept or reject it before knowing which of the lotteries will be randomly selected. Feedback about the selected lottery and the lottery outcome is only given at the end of the experiment. This design is adopted from Fehr and Götte (2007).

[26] All principals have a unique switching point. However, one principal rejected lotteries with low losses and accepted lotteries with high losses. Exclusion of this subject does not change the result.

5.2 Illusion of Control

Illusion of control is a concept from psychology that goes back to Langer (1975). Charness and Gneezy (2010) define illusion of control as being "concerned with greater confidence […] in a favorable outcome when one has a higher degree of personal involvement, even when one's involvement is not actually relevant" (p. 134). To assess the behavioral relevance of the illusion of control, Charness and Gneezy (2010) elicited individuals' willingness to pay for personally rolling (instead of the experimenter rolling) a die that determined an individuals' actual payment. They find that only a small minority of individuals (less than 10 percent) have a willingness to pay for rolling the die themselves in their task.

The findings of Charness and Gneezy (2010) cast doubt on the behavioral relevance of illusion of control. We nevertheless measured our subjects' illusion of control. The reason is that an illusion of control – if it existed – could have contributed to our main result because it could have increased the subjectively perceived *instrumental* value of the decision right.

We adopted a modified version of the incentive compatible elicitation method Charness and Gneezy (2010) used, and elicited each principal's willingness to pay for the right to personally roll the two ten-sided dice that determine the random outcomes in Part 1 and 2 of the experiment.[27] If principals are subject to an illusion of control, they should value rolling the dice positively because this increases their personal involvement in determining the final outcomes: If a participant opts not to roll, the experimenter casts the dice in front of the participant. If the participant rolls the dice, the experimenter watches him or her do so. In both cases, the experimenter enters the result on the participant's computer screen.

[27] Recall that there are up to three random outcomes per participant, i.e., the two ten-sided dice might have to be rolled up to three times. In Part 1, the participant who ultimately holds the decision right can determine the success of the project by rolling the dice, and two decisions are paid in Part 2, i.e. there are up to two lotteries with uncertain outcomes. The elicitation uses a Becker-DeGroot-Marschak mechanism where subjects could receive 30 points in return for giving up the right to roll the dice themselves (in the three cases mentioned above). Subjects stated how many of the 30 points they are willing to pay as a price for keeping the right to roll the dice themselves. They stated their willingness to pay before they knew whether they kept or received the decision right, and which lotteries were payoff relevant. The computer then drew the actual price from a uniform distribution over all integers from 1 to 30 including the bounds. If the actual price did not exceed the stated willingness to pay, a participant kept the right to roll the dice and received 30 points minus the actual price. If the actual price was higher, the subject received all 30 points and the experimenter rolled the dice.

In accordance with Charness and Gneezy (2010), we find that 91 percent of principals have no willingness to pay at all rolling the dice themselves. Hence, the correlation between the average individual intrinsic value of decision rights and the individual measure of control illusion is very low and even slightly negative ($\rho = -0.05; p = 0.71$).

5.3 Preference Reversals

It is a well-established result in experimental economics that preference reversals can occur when different procedures are used to elicit preferences on lotteries. This phenomenon was demonstrated by Slovic and Lichtenstein (1968) first, and received increased attention after a study by Grether and Plott (1979). They demonstrated that subjects valued some lottery A higher than a lottery B in a pricing task, but preferred lottery B over lottery A when faced with a binary choice between the two lotteries. The lotteries in these experiments usually involve a pair of lotteries with comparable expected value, but one lottery offers a high probability of winning a modest amount of money ("high-probability lottery"), whereas the other lottery offers a low probability of winning a large amount ("high-amount lottery"). Subjects tend to prefer the high-probability lottery when faced with a binary choice, but assign a higher value to the high-amount lottery in a pricing task. This phenomenon is shown to be due to overpricing of high-amount lotteries in the pricing task (Tversky, Slovic, and Kahneman, 1990).

Is it possible that the observed difference in certainty equivalents in Part 2 of our experiment stems from the phenomenon of overpricing of high-amount lotteries (relative to high-probability lotteries)? More specifically, is it possible that subjects characterize the delegation lotteries they face in Part 2 as high-amount lotteries and that they therefore place a higher certainty equivalent on these lotteries compared to the control lotteries?

The principals earn a higher amount in the delegation lottery in case of success than in the corresponding control lottery if $P_{\mathcal{P}}$ – C(E) is smaller than $P_{\mathcal{A}}$. It turns out, however, that there is no systematic relationship between the success payoff in the control lottery ($P_{\mathcal{P}}$ – C(E)) and the success payoff in the delegation lottery ($P_{\mathcal{A}}$). In 49.5 percent of the cases, the control lottery's success payoff is larger, in 49.5 of the cases it is the other way round, and in 1 percent of the cases the success payoffs are equal. There is thus no basis for characterizing the delegation lotteries as the “high-amount lotteries.” Moreover, our pairs of control and delegation lotteries also do not follow the high-probability vs. high-amount lottery pattern with respect to the success probabilities. The average success probabilities in the control and delegation lotteries are comparable; they amount to 60 percent in the control lotteries and to 51 percent in the delegation lotteries. In 49 percent of the lottery pairs, a higher success probability is observed in the control lottery, while the success probability is higher in the delegation lottery in 39.5 percent of the pairs. 11.5 percent of the pairs are equivalent.

Finally, as shown in Section 4.1, we not only find consistent and significant differences in the certainty equivalents, but in the expected values between the control and delegation lotteries as well. The principal’s actions in Part 1 of the experiment determine these expected values, i.e. the elicitation procedure in the lottery task cannot affect them. The overpricing of high-amount lotteries therefore cannot explain the differences in the expected values. It is exactly this overpricing, however, that underlies the preference reversal phenomenon.

5.4 Reciprocity

Preferences of intention based reciprocity (e.g. Rabin 1993) could, in principle, explain the measured difference in certainty equivalents in Part 2 of our experiment. To see this, consider the following argument: A negatively reciprocal principal chooses a low effort level E that becomes relevant if she remains in control because she only keeps, by design, the decision right if the agent does not fulfill her minimum effort requirement. If the principal perceives the agent’s effort choice as an “unkind act”—after all, it falls short of the minimum requirement for delegation— and she may act in kind and choose a low effort level in order to lower the agent’s expected payoff. The important consequence of this reciprocal reaction is that it reduces the principal’s expected payoff in the neutrally framed control lottery relative to the neutrally framed delegation lottery. This in turn lowers the respective certainty equivalent, which could explain our main finding.

For the reciprocity argument to be valid, the principal’s perceived unfriendliness when keeping the decision right should be higher, the lower the minimum effort requirement: If the agent does not even meet a very low requirement, the agent’s effort level must be very “unkind.” Hence, the differences in the certainty equivalents between the delegation and control lotteries in Part 2 should – according to the reciprocity argument – be the higher, the lower the minimum effort requirement. However, the opposite is true in our data. In a regression of the percentage difference in certainty equivalents on the minimum agent requirement, controlling for subject and game fixed effects, the percentage difference in the certainty equivalents *increases* by 4.5 percentage points per 10 point increase in the minimum agent requirement ($p<0.01$, standard errors clustered at the subject level). Thus, the data do not appear to be consistent with an explanation based on intentions based reciprocity.

5.5 Bounded Rationality

The validity of our results depends on the correct elicitation of the indifference point in the delegation game. Hence, a relevant concern with respect to our results is whether subjects understood the trade-off they faced in the delegation game. While it is not clear that a possible confusion on the part of the subjects would lead to a systematically higher valuation of the delegation over the control lotteries in Part 2, and not simply to more noise, we consider it important to highlight the measures that we took to ensure a clear understanding of the experimental conditions.

First, subjects received comprehensive and detailed instructions in which the trade-off between keeping and delegating the decision right was explained. They also had to answer detailed control questions correctly before they were allowed to participate in the experiment. In particular, principals were explicitly instructed to think about their point of indifference when choosing the minimum agent effort requirement: They were told to consider that the agent chooses some effort e, and to decide whether they would be willing to delegate the decision right to the agent *if he chooses precisely this effort level.* If they prefer keeping the decision right in this case, they were instructed to repeat the exercise assuming that the agent chooses an effort of $e + 1$. It was then explained to them that they should set the minimum requirement exactly at the lowest effort level of the agent at which they prefer delegating over keeping the decision right.

Hence, principals were instructed in a way that should lead them to reveal their point of indifference.[28]

Second, principals were given the possibility of revising their choices during the experiment. After having chosen the minimum requirement and the own effort for the case that the decision right is kept, principals were shown the consequences of these choices side-by-side on their computer screen.[29] In particular, they were shown the consequences of delegation assuming that the agent chooses precisely the minimum requirement (and project alternative $\mathcal{A}$), i.e., the worst possible outcome after delegation, and the consequences of keeping the decision right (given their own effort and choice of the alternative). Note that these are precisely the outcomes that define the control and the delegation lotteries. At this stage, principals had the possibility of revising all their choices, i.e. they could change the minimum requirement or the own effort choice if they wished to do so, for example. This design feature allowed them to fine-tune their choices in the delegation game in order to facilitate the revelation of the point of indifference.

Further, the data indicate that the principals understood the trade-offs they faced when setting the minimum effort requirement well. In Table 1, we present predicted values for the minimum requirement assuming that principals are risk neutral, purely self-interested, and do not derive intrinsic value from the decision right. While we should not expect the observed values to co-vary perfectly with these predictions, they are a useful benchmark for the variation in the actual minimum requirements across games. A regression of the chosen minimum requirements on the predictions for $\underline{e}$ in Table 1 confirms that the requirements vary as expected. The coefficient on the predictions is 0.74 ($p<0.01$), i.e. if the prediction increases by 1 point, the actually chosen minimum requirement increases by 0.74 points.[30] Hence, the principals react strongly and in the predicted direction to changes in the delegation trade-off, which is evidence that our subjects understood the experimental conditions well.

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[28] To avoid anchoring the principals to high effort values, the numerical example in the instructions started at an agent effort of 1. Consequently, if anchoring is a concern, it would work against our hypothesis, since it would create delegation lotteries of low value.

[29] An English translation of the instructions of the principal can be found on p.2 of the Online Appendix, and the screenshots of the principals' screen sequence in the delegation game can be found on p. 15 of the Online Appendix.

[30] Standard errors in the regression are clustered on the subject level.

6. Conclusion

Do people intrinsically value decision rights? To answer this question, we developed a novel experimental design that allows isolating the intrinsic value component of decision rights. Our data show that individuals value decision rights intrinsically. We demonstrate the robustness of our finding across different game parameterizations and find that the magnitude of the intrinsic value of decision rights is correlated across individuals and parameterizations.

Our results provide evidence for the existence of non-transferable private benefits of control. The implications of private benefits have been studied intensively in the theoretical corporate finance, governance, and organizational economics literatures. Proving the existence of such “psychic” private benefits makes a strong case for the relevance of the incomplete contracting approach in these literatures. Moreover, our results have implications for the allocation of decision rights within organizations because the intrinsic value of decision rights can constitute frictions to the efficient delegation of decision rights. The establishment of the intrinsic value of decision rights also provides an additional rationale for implementing high-performance work systems in firms. Such modern forms of human resource management practices grant decision rights to workers that allow them to work more efficiently. If workers value decision rights as such, additional efficiency gains might be realized by granting work autonomy.

What determines the size of the intrinsic value of decision rights? In this paper, we can only provide preliminary answers to the situational determinants of the intrinsic value. We find that stake size matters. Doubling the stake size involved in a decision roughly doubles the intrinsic value component. This finding is important with regard to the outside relevance of our experimental findings. It suggests that the intrinsic value of decision rights can be substantial in a real world environment where stakes can be very large. With regard to the conflict of interest between the principal and the agent, a first intuition might suggest that the intrinsic value of decision rights is larger, the larger the conflict of interest. If their interests are perfectly aligned, for example, having the decision right might not be so important. Our data, however, point in the opposite direction. Our interpretation is that decisions where the pursuit of self-interest runs counter the interests of another party have an “unpleasant” component attached to them, which reduces the intrinsic value of decision rights. This effect might go so far that the intrinsic value of decision rights turns even negative in situations with undesirable outcomes, which would be consistent with recent experimental findings on the attribution of responsibility for unfair decisions (Bartling and Fischbacher, 2012). We consider gaining further insights into the situational determinants of the intrinsic value of decision rights to be an interesting field for future research.

The finding that individuals intrinsically value decision rights naturally leads to the question of the *ultimate* reason why people value decision rights beyond their instrumental benefits. One potential source directly stems from having or not having decision rights. Social psychologists argue that "human needs", such as power (McClelland, 1975) or autonomy (Deci and Ryan, 1985) constitute the source of the intrinsic value of power and autonomy. While the need for power implies that individuals value decision rights positively, the need for autonomy is potentially based on an aversion against being subordinate. Alternatively, decision rights could be intrinsically valuable because the utility received from specific outcomes depends on whether the outcome is a consequence of one's own actions, the actions of someone else, or not the consequence of a choice at all. For example, Nozick (1975, pp. 48-51) argued that a person who shapes his own life according to his own plan gives meaning to that life. Hence, the same outcome may be more valuable if it is self-chosen rather than imposed by someone else.[31]

[31] Mill (1859, Chapter III) put forward a similar argument in his defense of liberty: "He who lets the world, or his own portion of it, choose his plan of life for him, has no need of any other faculty than the ape-like one of imitation. He who chooses his plan for himself, employs all his faculties. He must use observation to see, reasoning and judgment to foresee, activity to gather materials for decision, discrimination to decide, and when he has decided, firmness and self-control to hold to his deliberate decision. And these qualities he requires and exercises exactly in proportion as the part of his conduct which he determines according to his own judgment and feelings is a large one. It is possible that he might be guided in some good path, and kept out of harm's way, without any of these things. But what will be his comparative worth as a human being? It really is of importance, not only what men do, but also what manner of men they are that do it."

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Appendix: Discussion of Corner Solutions

Our mechanism may fail to elicit a principal's point of indifference if she chooses a corner solution for $\underline{e}$ (see footnote 16). While principals rarely select $\underline{e} = 100$ (1.9 percent) in our experiment, we observe a non-negligible share of $\underline{e} = 1$ choices (15.8 percent). If the principal chooses $\underline{e} = 1$, we cannot rule out that the value of the control lottery $U(x, y, E|\delta = 1)$ is strictly smaller than the value of the delegation lottery $U(x', y', e = 1|\delta = 0)$, i.e. the principal may still strictly prefer the delegation lottery.

If there is such a residual value difference between the lotteries, then the principal would be even willing to pay for delegation – on top of accepting a lottery in which an agent chooses $e = 1$. Only when this payment equals the residual value difference, the principal would again be indifferent between delegating and keeping the decision right. In our experiment, however, we did not elicit such an additional willingness to pay for delegation, and hence our mechanism may fail to elicit the principal's point of indifference in these cases. When eliciting the certainty equivalents in Part 2, the difference in certainty equivalents may therefore not only contain the intrinsic value of the decision right, but also the residual value difference. Hence, this difference may be a confounded measure of the intrinsic value of the decision right (see equations 14 to 17).

The question thus is whether there indeed exists such a residual value difference for principals who choose $\underline{e} = 1$. To examine this question, we conducted a control treatment with 34 subjects. The first part of this treatment was equivalent to Part 1 of our main treatment. This treatment served the purpose to identify those principals who chose $\underline{e} = 1$. In the second part of this control treatment we measured whether for these principals, there exists such a residual value difference. The second part of the experiment proceeded as follows: The parameters of the various games were identical to the parameters in the first part. However, it was common knowledge in the second part that the agents always had to choose an effort of e = 1 and project alternative $\mathcal{A}$ in case of delegation, and that delegation is potentially costly for the principal. In addition, instead of merely naming a minimum effort requirement, as in part 1, the principals explicitly stated whether they want to delegate or not. If a principal kept control, she had to choose her implementation effort and the project alternative; if the principal preferred delegation, we explicitly asked the principal to state her willingness to pay for delegation. The actual cost of delegation was drawn from a uniform distribution between 0 and 100 points. If the stated willingness to pay for delegation was above the realized cost, the principal paid that actual cost and delegated the decision right. Otherwise, the principal kept the decision right and her chosen project alternative and effort were implemented. This procedure ensured that the principals had an incentive to state a willingness to pay for delegation that exactly matches the residual value difference of the lotteries in the first part of the experiment. Hence, the willingness to pay for delegation informs us about the extent to which we may be overestimating the intrinsic value of decision rights when corner solutions are chosen.

The corner solution $\underline{e} = 1$ was chosen 31 times (18 percent of the cases) in the first part of the control treatment, but the same principals were not willing to pay anything for delegating in 30 out of these 31 cases in the second part. We thus show that those principals who choose a minimum requirement of 1 almost never have a residual value difference, and conclude that our elicitation method for the intrinsic value of decision rights is also valid for those principals who choose $\underline{e} = 1$.