

Control aversion in hierarchies

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ABSTRACT

Companies typically control various aspects of their workers' behaviors. In this article, we investigate whether the hierarchical distance of the superior who imposes such control measures matters for the workers' ensuing reaction. In particular, we conduct a laboratory experiment to test whether potential negative behavioral reactions to imposed control are larger when they are implemented by a direct superior rather than a hierarchically more distant superior. We find that hierarchical proximity indeed magnifies such control aversion and discuss several potential channels for this result (JEL C92, D23, M12).

1. INTRODUCTION

Companies typically exert some level of direct control over the behaviors of their workers. For example, many companies set a minimum amount of working hours, decide where work should be conducted, or enforce a dress code. In practice, such control decisions can be taken by different layers of the corporate hierarchy. For example, following the recent surge in home office work due to the coronavirus disease 2019 (COVID-19) pandemic, many companies have started to require their workforce to return to the office. In some companies, for example, Apple, Goldman Sachs, and Tesla, that control decision is taken by the top management and implemented across the whole workforce. Amazon CEO Andy Jassy, on the other hand, initially delegated that control decision to the individual team managers, but reversed that decision 2 years later, ordering that staff be at the office 5 days per week.¹

Hence, the question arises which layer of the hierarchy *should* exert control. In this respect, taking into account potential adverse effects of control on worker behavior may be a relevant aspect: If some workers have non-pecuniary motivation in the absence of control,

¹ See <https://www.ft.com/content/9f3e0159-f0e2-4a33-aeba-b0945558963f> and <https://www.ft.com/content/401e13fe-d065-4c07-9b51-e21fa38ad6e1>

controlling them may crowd out this part of their motivation and reduce their performance.² In some cases, such control aversion can even lead to an overall negative effect of control (Falk and Kosfeld 2006). Therefore, we ask whether or not workers' reactions to imposed control differ conditional on whether control is implemented by a direct superior rather than a hierarchically more distant superior. The answer to this research question could thus inform applied managerial decisions, in particular by providing top management with an additional rationale to consider when deciding whether to retain or delegate controlling decisions.

To study our research question, we designed and conducted a laboratory experiment. Using a laboratory experiment allows us to establish a causal link between hierarchical distance in control and control aversion: The exogenous allocation of the controlling decision within the hierarchical structure of the (experimental) organization enables a clean identification of a potential causal effect. By contrast, establishing causality is nearly impossible using observational real-world data, given that the allocation of controlling decisions within the hierarchy is endogenous.

Our experimental design builds on Falk and Kosfeld (2006), but extends the setup to emulate organizations with a three-layer hierarchy in which participants assume one of three randomly assigned roles: CEO, supervisor, or worker. An organization consists of one CEO who manages two teams, each consisting of a supervisor–worker pair. Each worker receives an endowment of 120 points and can decide to transfer part of their initial endowment to the organization. Each point transferred to the organization increases the payoff of the CEO by one point and the payoff of the paired supervisor by two points, making the transfer efficient. In each organization, the CEO can decide to exert control or to delegate the decision to the supervisors. Independent of whether control is implemented by the CEO or the supervisors, it implies that a minimum transfer requirement of five points is imposed on the worker. If both choose not to control, the worker is free to choose any transfer, including transfers of less than five points. Our main outcome of interest is whether the workers' transfers differ depending on whether control is exerted by the CEO or by the supervisor.

We predict that the workers negative reaction to control is weaker when control is imposed by the CEO rather than the supervisor. This prediction is based on several complementary mechanisms. Multiple mechanisms that can be present in multi-layer hierarchies contribute to this effect: First, it has been hypothesized that negative reactions to control are a consequence of control being interpreted as a signal of distrust (Falk and Kosfeld 2006). If the CEO controls, it affects the whole organization, which implies that workers need not interpret control as a signal of distrust directed at them personally. In contrast, control by the supervisor only affects the supervisor's team, which in turn implies that the signal is more personally directed and thus potentially stronger. Moreover, worker actions always affect the payoff of both their direct supervisor and the CEO, but the effect on the former is often more direct, and thus stronger. Consequently, if reductions in transfers are primarily a negatively reciprocal reaction toward the person that controls, they induce a stronger negative externality on the supervisor when the CEO controls, relative to the externality on the CEO when the supervisor controls. The reaction to control imposed by the CEO may thus be softened, because some workers may want to avoid to primarily harm their supervisors.³

Our results show that, if control is exerted by the CEO, workers on average transfer 24.3 points, which is significantly more than the average transfer of 22.4 if control is exerted by the supervisor. If uncontrolled, workers on average transfer 29.8 points. Thus, workers indeed react differently conditional on who controls them and exploiting this mitigates the

² Such non-pecuniary motivation could stem from, for example, an individual's desire to perform the task for its own sake (Bénabou and Tirole 2003; Cassar and Meier 2018), a social norm (Sliwka 2007), pride and self-esteem (Ellingsen and Johannesson 2008), or reciprocity (Von Siemens 2013).

³ Further potential reasons for differential reactions could be the assignment of causal responsibility or the hierarchical distance in itself. In Section 2, we discuss each of these potential mechanisms in more detail.

negative effects of control by 26% on average in our experimental setting.⁴ Furthermore, our results are exclusively driven by an effect on the intensive and not the extensive margin. That is, the fraction of workers who transfer the minimum amount possible does not differ depending on who controls, but those workers who are willing to transfer more than the minimum amount possible transfer significantly more if the control decision is taken by the CEO. Overall, our results suggest that firms can benefit from retaining decision rights at the highest level of the hierarchy, as it reduces behavioral costs of control.

To understand the relative relevance of the potential mechanisms for our results, we ran an additional treatment in which we varied the *breadth of the organization*, which is an important dimension of organizational structure. Specifically, we reduced the breadth of the organization by decreasing the number of supervisor–worker pairs below the CEO from two to one. While exogenously varying the breadth of the organization is informative in understanding how our main result changes conditional on organizational breadth, a change in organizational breadth also varies the relative relevance of the behavioral mechanisms that we outlined above. We hypothesize that organizational breadth could be a moderator of the relative behavioral response to control conditional on who in the hierarchy exercises control. In particular, reducing organizational breadth makes the CEO’s controlling decision relatively more personal, which should increase the worker’s behavioral response to CEO control. At the same time, a reduction in organizational breadth implies that each individual worker’s effort becomes relatively more important for the CEO, in turn increasing the externality on the CEO under supervisor control.⁵ Jointly, the induced change in the two mechanisms implies that an increase in organizational breadth should increase the benefit of CEO control compared to Supervisor control. In addition, the new treatment allows us to isolate the relative influence of both mechanisms.

Our results show that the benefit of CEO control indeed significantly increases with organizational breadth. The personalized distrust and the externality mechanism contribute about equally to this effect, albeit each of them on its own does not trigger a statistically significant effect.

Our results contribute to the literature on the trade-offs involved in the decision to centralize or delegate decision-making in firms. This literature has so far highlighted, among other things, the importance of information, incentives and agency issues at different levels of the hierarchy (Aghion and Tirole 1997; Fehr et al. 2013; Bandiera et al. 2021), the need for coordination (Dessein 2002; Hart and Moore 2005; Alonso et al. 2008; Evdokimov and Garfagnini 2019; Hamman and Martínez-Carrasco 2023),⁶ the diffusion of new technology (Acemoglu et al. 2007), or preferences for power (Bartling et al. 2014; Pikulina and Tergiman 2020; Dessein and Holden 2022). Previous studies have also shown that

⁴ Our finding of negative effects of control is in line with Falk and Kosfeld (2006), who also find hidden costs of control in their two-layer hierarchy. Note that this finding is partially a consequence of the very ineffective control device that we have implemented. Control only forced the workers to implement a minimum transfer of five points. This design choice was on purpose, as we aim to identify differences in the adverse effects of control conditional on hierarchical distance of the controlling party, and are less interested in whether or not control on average is profitable for the organization.

⁵ The relationship between organizational breadth and the externality on other members of the organization depends on the production process and the distribution of surplus within the organization. Therefore, while it seems often plausible that the relative effect of individual worker effort on the outcome of the CEO decreases as the organization grows (organizational breadth increases), this relationship is not universally true (in contrast to the relationship between personalized imposition of control and organizational breadth). In our additional experiment, the effect of worker effort on the CEO’s outcome was increased as a design choice.

⁶ Evdokimov and Garfagnini (2019) and Hamman and Martínez-Carrasco (2023) experimentally investigated the interplay between control, coordination, and information asymmetry in organizations. Evdokimov and Garfagnini (2019) tested the model developed in Alonso et al. (2008) and found behavioral deviations from predicted results. Hamman and Martínez-Carrasco (2023) tested a model of control under endogenous team selection linking successful decision making to certain psychological traits.

principals can profit from delegating self-serving decisions that can hurt third parties. This is because delegation effectively reduces blame (Bartling and Fischbacher 2012), punishment (Coffman 2011; Coffman and Gotthard-Real 2019), and feelings of accountability for undesirable outcomes (Hamman et al. 2010). By contrast, our results highlight a potential advantage of centralization: Retaining controlling decisions at the top of a vertical hierarchy is beneficial in that it mitigates the subordinates' negative reaction to control, and we show that this effect is primarily driven by a reduction in the personalized imposition of control as well as the implied externality of effort reductions on members of the organization that are not involved in the control decision.

Our article therefore also contributes to the experimental literature studying the moderators of hidden costs of control. Since Falk and Kosfeld (2006) provided the first clean evidence for hidden costs of control, the laboratory experiments that followed their original work have shed light on possible mitigating factors, such as perception of legitimacy (Schnedler and Vadovic 2011; Herz and Zihlmann 2024b), procedural aspects (Kessler and Leider 2016), and third-party control (Burdin et al. 2018).⁷ The existence of hidden costs of control was also shown in the field (Belot and Schröder 2016; Herz and Zihlmann 2024a). Further, it was shown that negative reactions to control are larger if the relationship is more interpersonal, either because the relationship is non-anonymous and repeated (Dickinson and Villeval 2008) or because the interaction is online rather than in the lab (Schmelz and Ziegelmeyer 2020). We demonstrate that the hierarchical structure of an organization can act as a relevant moderating force of hidden costs of control, and we highlight the importance of personalized imposition of control and externalities for this effect.

2. THE EXPERIMENT

In this section, we summarize our experimental design, the procedures, and our main hypothesis including the mechanisms that support it.

2.1 Design

The aim of our laboratory experiment is to study agents' behavioral reaction to control in vertical hierarchies. Extending the principal-agent game proposed by Falk and Kosfeld (2006), we consider a three-tier hierarchy. At the beginning of the experiment, participants are randomly assigned to groups of five and to one of three roles: CEO, supervisor, or worker. Each group forms an "organization" where one CEO manages two teams and each team consists of a supervisor-worker pair. Figure 1 illustrates the vertical structure of the organization studied in this experiment. Though simple, our design attempts to replicate the hierarchical structure of large real-world organizations, where subordinates may be monitored or controlled by relatively more distant or closer superiors.

Each worker chooses a productive activity (or transfer) that is costly to him- or herself, but benefits both the paired supervisor and the CEO. The CEO and the supervisors do not engage in productive activities, but they may decide to impose control on the workers by mandating a minimum transfer level. The control decision is sequential and applies to all the

⁷ Schnedler and Vadovic (2011) show that hidden costs of control are lower when agents view the controlling decision as legitimate because it prevents selfishness or theft. Kessler and Leider (2016) find that how the way the controlling decision comes about matters for the agents' reaction. Burdin et al. (2018) show that control imposed by a third party, who is neutral in that they are not directly affected by the agent's ensuing decision, brings about more muted behavioral reactions. Some laboratory replications could not confirm the finding that the overall effect of control is negative (e.g., see Ziegelmeyer et al. 2012).

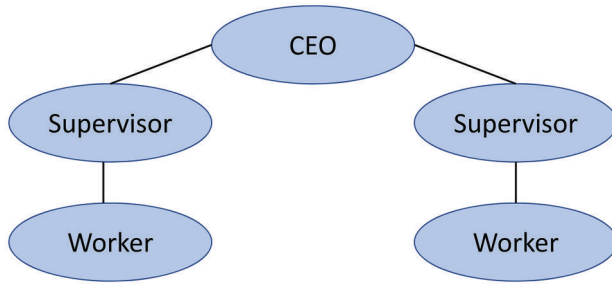


Figure 1. Organizational structure.

lower layers in the organization: that is, the CEO's decision applies to both teams, whereas each supervisor's decision only applies to the paired worker.

More precisely, each worker $i \in \{1, 2\}$ has an initial endowment of 120 points, whereas the CEO and the supervisors have no endowment. Each worker i selects a transfer $x_i \in \{\underline{x}, \underline{x} + 1, \dots, 120\}$, where $\underline{x} = 5$ if either the CEO or supervisor i imposed control, and $\underline{x} = 0$ if no control is imposed. Exerting control thus restricts a worker's choice set. The transfer entails a monetary cost $c(x_i) = x_i$ to worker i and results in a monetary benefit of $2x_i$ to the paired supervisor i and x_i to the CEO. The CEO's, supervisor i 's, and worker i 's payoff functions are, respectively, $\pi_{CEO} = x_1 + x_2$, $\pi_{SV,i} = 2x_i$, $\pi_i = 120 - x_i$. The decision process involves the following three stages:

- 1) The CEO decides whether to impose control, that is, set $\underline{x} = 5$, or to delegate this decision to the supervisors. The CEO's choice is binary, that is, $\underline{x}_{CEO} \in \{\text{delegate}, \text{control}\}$.
- 2) If the CEO imposes control, both supervisors have to implement the CEO's decision for their respective worker and have no own choice to make. If the CEO delegates the decision, each supervisor independently chooses whether or not to control their paired worker. In this case, supervisor i 's choice is binary $\underline{x}_{SV,i} \in \{\text{no control}, \text{control}\}$.
- 3) Each worker i independently decides how much to transfer given their choice set, and the respective payoffs are obtained.

This sequence of decisions affords us to observe workers' transfers for three separate cases: *No Control*, *Control by Supervisor*, and *Control by CEO*. Our main outcome of interest is whether workers' transfers differ after *Control by CEO* from those after *Control by Supervisor*.⁸

Although our design is based on the original design in Falk and Kosfeld (2006), there are a few important differences inherent in extending the design to multi-layered hierarchies that are worth discussing. We designed the relation between the worker and the superior such that it exactly mirrors the two-party design in Falk and Kosfeld (2006). The addition of the third layer, the CEO, who is also a recipient of payments in the organization, then necessarily implies important changes. The CEO also receives a transfer from the worker, with a multiplier of one. Thus, transferring points becomes more efficient relative to Falk and

⁸ Note that the outcome *No Control* can only be jointly implemented by both CEO and supervisor, whereas control can be individually implemented either by CEO or supervisor. Thus, the workers' reactions to control can be attributed to the individual decisions of either the CEO or the supervisor. While we believe that this setup is realistic in that it is often infeasible for the upper layers of a hierarchy to ensure that supervisors do not exert control, there may be cases in which CEOs can impose *No Control* directly. Studying such cases in future research constitutes an interesting research avenue for control aversion in hierarchies.

Kosfeld (2006), given that one transferred point generates a total surplus of three points in our setting. We chose a multiplier of one given that the CEO benefits from the transfers made by two workers. Thus, an important focal transfer amount remains constant relative to Falk and Kosfeld (2006): If each worker transfers 40 points, the resulting outcome is a payment of 80 points for each party.

2.2 Main hypothesis and mechanisms

Before reporting the results of the experiment, we summarize our hypothesis. Akin to Falk and Kosfeld (2006) and subsequent studies, we expect some workers to exhibit a negative reaction to control, that is, to make lower transfers when they are controlled than when they are not. Novel in our study is the conjecture that the workers' reaction to control differs depending on the hierarchical distance of the superior who exerts control. In particular, our key hypothesis is that workers' adverse reaction to control decreases with the hierarchical distance to the individual who imposes control. For our specific experimental setup, this hypothesis leads to the following prediction:

Hypothesis 1. *The workers' transfers are larger when control is imposed by the CEO rather than by the supervisor.*

Why would we expect a larger effect of being controlled if it is imposed by the hierarchically less distant supervisor? We believe several complementary mechanisms may contribute to a potential effect of hierarchical distance on control.

2.2.1 Personalized imposition of control

Control can trigger a negative response if it is perceived as a signal of distrust. If a supervisor controls a worker, that worker is clearly the target of his or her control and the worker might feel directly distrusted. A CEO's decision to control, on the other hand, applies to all workers in the organization, and not just to one individual worker. Thus, the signal of distrust is *diffused* if it is sent by the CEO rather than a direct supervisor, and this could lead to a reduction in control aversion.⁹

2.2.2 Externality

A reduction in worker effort in response to an imposition of control has an externality to another individual in our setup. We define the externality as the marginal impact that a reduction in effort has on the "innocent" party (i.e., the party that did not exert control). The asymmetry in marginal effects of transfers by the workers on their payoffs may play a role.

Because of asymmetry, the worker may be more hesitant to reduce transfers if the CEO imposes control, knowing that this will hurt more the "innocent" supervisor. On the other hand, if the supervisor controls and the worker reacts negatively, the reaction also hurts the "innocent" CEO, but to a lesser degree. This could lead to a stronger reaction to control if the supervisor imposes it.

2.2.3 Distance and pivotality

Distance by itself may be a moderating factor: there are more layers of corporate hierarchy between the CEO and a worker than between the supervisor and a worker. For example,

⁹ Consistent with such an argument, Hagemann (2007) finds that the benefits of controlling a team of agents are increasing in the team size. However, in her design, increases in the group size were by design also directly associated with reduced returns of agent transfers.

Frey (1993) argues that when there is a closer relationship with the superior, control magnifies the crowding-out effect of a worker's intrinsic motivation.¹⁰

In addition to that, a worker could perceive the supervisor to be more *responsible* for the implemented control than the CEO, and this heightened responsibility could trigger a stronger negative reaction. For example, in the *causal responsibility* model by Engl (2018), the degree of responsibility depends on how close an action is from being pivotal for an event. In our setting, after delegation by the CEO, a supervisor's decision to control is always pivotal and, thus, s/he bears full responsibility. This is not the case for a CEO who exerts control, as the CEO's alternative choice (delegation) could also lead to control by the supervisor. Thus, control by the CEO is only pivotal with a certain probability, which reduces the CEOs responsibility for control.

The presence of some of the aforementioned mechanisms in multi-layered hierarchies can depend on the specifics of the organizational design and production function. Taken together, as well as each mechanism individually, they suggest that increased hierarchical distance can decrease control aversion. In our experimental analysis, we first identify whether these factors *jointly* affect the response of workers to being controlled. In a second step, we try to decompose the relative importance of each of these factors.¹¹

2.3 Experimental procedures

At the beginning of a session, participants were informed that the experiment consisted of several parts and that one of the parts would be later randomly selected to determine their payout. Participants received instructions only at the beginning of each part.¹² We used the strategy method for roles. In Part 1, all participants made decisions taking up the role of worker, followed by the role of supervisor (Part 2), and CEO (Part 3). Lastly, all participants completed a short questionnaire (Part 4).

We adopted a within-subjects design and made use of the strategy method to elicit the participants' choices in the role of worker and supervisor. In Part 1, each participant had to decide on the transfer x for three possible cases: (1) if neither the CEO nor their paired supervisor had restricted their choice set (*No Control*); (2) if the CEO had left the supervisors free in their decisions, but their paired supervisor had set a minimum transfer requirement of five (*Control by Supervisor*); (3) if the CEO had forced all supervisors to set a minimum transfer requirement of five so that their paired supervisor had no choice but to enforce the CEO's decision (*Control by CEO*).¹³ After making these choices, the participants were asked to report their belief about the fraction of supervisors who chose to impose control when the CEOs left them free to decide whether or not to set the minimum transfer requirement.¹⁴

Upon completion of all four parts, participants were randomized into roles (and therefore study parts) and matched into organizations consisting of one CEO, two supervisors and two workers. The respective decisions taken were then executed. The associated payoffs

¹⁰ Consistent with this argument, Dickinson and Villeval (2008) find that lower anonymity and repeated interaction magnify adverse reactions to control, and Schmelz and Ziegelmeyer (2020) find that participants in a laboratory experiment display stronger control aversion than participants in an internet experiment. Contrary to these experiments, our setup solely varied the proximity in the organizational hierarchy, but social proximity was held constant (members of an organization were anonymous and were all participants of the same laboratory session).

¹¹ Note that, in real organizations, additional mechanisms might be present that cannot be captured by our laboratory experiment. For example, a real CEO possesses more natural authority and thus his or her control decisions might be more acceptable to workers than control decisions made by lower levels of the hierarchy.

¹² The instructions and screenshots of decision-relevant stages can be found in the replication package.

¹³ The choices were always presented in the same order, followed by a summary screen on which all three choices were simultaneously displayed and could still be changed. Thus, all three choices were submitted simultaneously.

¹⁴ Specifically, a participant had to indicate how many out of ten supervisors would set the minimum transfer requirement of five points for their workers. This question was not incentivized.

were announced at the end of the session. We applied the conversion rate of 1 point = 0.1 CHF. On average, an experimental session lasted 45 min and average earnings amounted to 17.2 CHF (16.5 Euros), including a show-up fee of 10 CHF.

The experiment was computerized using the software oTree (Chen et al. 2016). Details of the design, the hypotheses, and the analysis had been preregistered on AsPredicted (#78686). The experiment was conducted in the experimental economics laboratories in Fribourg (134 participants) and Bern (63 participants) in November 2021.¹⁵ Participants were mostly students recruited via ORSEE/Sona (Sona Systems n.d.; Greiner 2015). The average number of participants in each experimental session was 20.¹⁶

3. RESULTS

In this section, we report the results of our experiment focusing on workers' transfer choices and their determinants.¹⁷ Our main finding concerns the differential effect of control exerted by supervisors or CEOs on workers' transfers. Table 1 summarizes the workers' average and median transfer choices for the three possible cases.

Comparing *Control by Supervisor* with *Control by CEO*, we find that the former tends to elicit lower transfers from the workers. On average, workers transfer 22.43 points if they are controlled by their supervisor and 24.33 points if they are controlled by the CEO. This difference is statistically significant (paired t-test, $p = 0.033$; Wilcoxon signed-rank test, $p = 0.022$).¹⁸ Furthermore, also the median transfer is higher after *Control by CEO* compared to *Control by Supervisor* (20 versus 15). This yields our first result:

Result 1. *Workers' transfers are significantly higher when they are controlled by the CEO rather than by their supervisor.*

Result 1 directly relates to and confirms our prediction. When control has to be implemented, it is better to retain the control decision in the higher levels of the hierarchy and not delegate it downwards. On the individual level, there exists substantial heterogeneity with respect to workers' reaction to control. Out of 197 participants, 43 do not react to any type of control. A total of 80 participants react to control, but don't differentiate depending on who controls. Of the participants who differentiate their transfer depending on who controls, 43 transfer a higher amount if controlled by the CEO compared to their supervisor, while 31 transfer a lower amount if controlled by the CEO.

Without control, workers on average transfer 29.75 points. Thus, they transfer significantly more than when control is exercised, independent of who imposes control

¹⁵ The experiment was run during the Covid-19 pandemic. Thus, participation was restricted to participants with a valid vaccination certificate, and wearing a face mask was obligatory during the study. Swiss law did not require any additional measures at the time.

¹⁶ The experiment was programmed such that sessions could also be run even when the number of participants was not divisible by five. In this case, remaining participants would be allocated to study Part 4 (the survey) after having made the decisions in all roles, and received a flat payment of CHF 7. Assignment to the different study parts was random.

¹⁷ The analysis of supervisors' and CEOs' choices is not part of our main research question and therefore is reported in Appendix A.2.

¹⁸ All reported tests are two-sided. When applying the Wilcoxon signed-rank test, we use the Wilcoxon method to correct for ties. When the Pratt method is used to correct for ties, the p -value is somewhat higher ($p = 0.096$). Note that, while we pre-registered the Wilcoxon signed-rank test, we realized ex-post that the t-test is the more suitable test for our data, given that the Wilcoxon signed-rank test is designed for continuous data, but our data contains a substantial amount of ties (for which corrections have to be applied). In addition, the substantial sample size implies that the parametric assumptions of the t-test are asymptotically met.

Table 1. Workers' average and median transfer choices.

	Transfers	
	Average	Median
No control	29.75	30
Control by supervisor	22.43	15
Control by CEO	24.33	20

Table 2. The differential effects of control on workers' transfers.

	OLS (1)	OLS (2)	Hurdle Model	
			Probability (3a)	Amount (3b)
No control (Constant)	29.75*** (1.84)	35.82*** (12.19)	1.72** (0.75)	29.64** (14.30)
Control by supervisor	-7.32*** (1.47)	-7.32*** (1.48)	-0.17*** (0.03)	-4.84** (1.86)
Control by CEO	-5.42*** (1.50)	-5.42*** (1.51)	-0.18*** (0.03)	-1.82 (1.90)
Supervisor versus CEO (<i>p</i> -value)	0.034**	0.034**	0.833	0.018**
Controls	No	Yes	Yes	Yes
Observations	591	591	591	423
Cluster	197	197	197	169
R-squared	0.018	0.054	0.114	0.022

Notes: The dependent variable in regressions (1), (2), and (3b) is the size of the transfer by workers, whereas the dependent variable in regression (3a) is a dummy variable that equals 1 if workers transfer more than the MTR. Probability reports the marginal effects from a Probit regression calculated at the mean. Amount is the result of the linear regression truncated at the minimum transfer. Robust standard errors are clustered at the subject level and are reported in parentheses. Row "Supervisor vs CEO (*p*-value)" reports *p*-values from Wald tests comparing the coefficients for control by supervisor and control by CEO. Control variables include age, gender, education level, major in business and economics, Swiss nationality, and whether the respective session was conducted in Bern or Fribourg.

***, **, and * denote significance at 1%, 5%, and 10%, respectively.

(paired *t*-test, $p < 0.001$; Wilcoxon signed-rank test, $p < 0.001$). This implies that the hidden costs of control outweigh the benefits and generate an overall negative effect.¹⁹

In Table 2, we report the coefficients of OLS regressions in which the dependent variable is the size of the transfer (Columns (1) and (2)). The regressions confirm our findings: Compared to *No Control*, both types of control yield significantly negative effects. Furthermore, the negative effect is significantly smaller when control is exerted by the CEO compared to the supervisor (Wald test, $p = 0.034$). Quantitatively, *Control by CEO* reduces the adverse effect of control compared to *Control by Supervisor* by about 26% in our experimental setting.²⁰ This yields our second result:

¹⁹ Thus, we replicate the findings of Falk and Kosfeld (2006). However, note that the size of the reaction is smaller than in the original study. This could be because of differences in the design (transfers are more efficient in our setting, given that there is an additional beneficiary of transfers, and a reduction in transfer always also hurts an innocent party), or because of differences in the general pro-sociality of the subject pool.

²⁰ In line with the statistical approach proposed by Ziegelmeyer et al. (2012), Table A1 in Appendix A.1 reports the average differences between the workers' transfers in the three cases along with bootstrapped confidence interval. The 95% bootstrapped confidence interval of the difference $x^{SC} - x^{CC}$ does not include zero, which lends further support to our results.

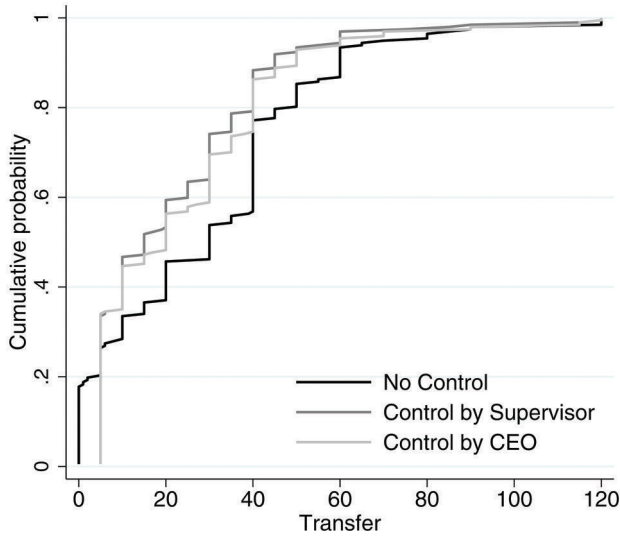


Figure 2. Cumulative distribution of workers' transfers.

Result 2. *The hidden costs of control outweigh its benefits. Such hidden costs are significantly smaller when the CEO instead of the supervisor exerts control.*

To investigate the workers' behavior in more detail, we next look at the underlying distribution of transfers. Figure 2 illustrates the cumulative distribution of workers' transfers in the three cases. Several observations stand out: First, about 20% of workers in the *No Control* condition transfer less than five points. For those workers, control is effective in increasing their transfer level. Second, for all transfers above five points, the cumulative frequency of workers in the *No Control* condition is smaller than in the two *Control* conditions, implying that the number of workers that transfer less than that amount is smaller. Third, comparing transfers with control, the fraction of workers who transfer exactly five points does not differ between the two conditions (CEO versus Supervisor), whereas there is a visible difference for transfers above five points.²¹

The last observation suggests that the difference in the reaction to control between the two conditions stems from a differential effect of control on the intensive, but not the extensive margin of transfers. To test whether this is indeed the case, we estimate a hurdle model. The model, presented in Columns (3a) and (3b) of Table 2, allows us to separate the extensive from the intensive margin. By extensive margin we mean whether a worker transfers more than the minimum required by the supervisor or the CEO. By intensive margin we refer to the transfer size, conditional on transferring more than the required minimum. The model highlights how the mitigating effect of control by the CEO works exclusively through the intensive margin: While control significantly decreases the probability of transferring more than the required minimum in both control conditions, there is no significant difference between the two conditions (Wald test, $p = 0.833$). Looking at the intensive margin, *Control by Supervisor* leads to a significant negative effect on the conditional amount

²¹ Statistically, we find that the three distributions are all significantly different from each other (one-sample Kolmogorov-Smirnov tests, $p < 0.001$). This remains valid even after correcting for the fact that, in the *No Control* condition, transfers below 5 were possible but not in the other two conditions (one-sample Kolmogorov-Smirnov tests, $p < 0.001$).

transferred compared to *No Control*. In contrast, *Control by CEO* has no significant impact on those that transfer more than the minimum compared to *No Control*. Hence, the conditional transfers after *Control by CEO* are significantly greater than those after *Control by Supervisor* (Wald test, $p = 0.018$). Table A2 in Appendix A.1 reports the results of the hurdle model without controls. We summarize these findings in our last result:

Result 3. *Workers who are controlled by their CEO are equally likely to transfer the minimum transfer level compared to those controlled by their supervisors. However, control by supervisor significantly decreases the conditional amount transferred, whereas this is not the case for control by CEO.*

Result 3 shows that there are some workers who provide effort without control and who react maximally negatively when control is implemented. For those workers, it doesn't seem to matter who controls. On the other hand, there are workers who are not fully deterred by control and those workers take into account which hierarchical level implemented control.

3.1 Underlying mechanisms: organizational breadth

The previous section provides evidence that CEO control triggers smaller negative behavioral reactions than Supervisor control, but the experimental design did not allow us to draw further conclusions regarding the underlying mechanisms of this reaction, as outlined in Section 2.2. To better understand the causes of the observed effect, we therefore conducted a follow-up experiment that only features one CEO and one supervisor–worker pair (henceforth, Treatment 111). As in the original experiment (henceforth, Treatment 122), the worker has an initial endowment of 120 points, whereas the CEO and the supervisor have no endowment. The CEO's, the supervisor's, and the worker's payoff functions are $\pi_{CEO} = 2x_i$, $\pi_{SV} = 2x_i$, $\pi_i = 120 - x_i$, respectively. Because the new treatment only has one division (one supervisor–worker pair) below the CEO, the treatment manipulation can be thought of as *reducing the breadth of the organization*. As a consequence, note that the CEO only receives the transfer from one worker instead of two. We thus made the design choice to double the return of the worker's transfer to the CEO. Therefore, worker transfers are more efficient in Treatment 111 than in Treatment 122.²²

Varying the breadth of the organization allows us several interesting insights into the behavioral reactions to control. First, it allows us to observe whether worker reactions to supervisor and CEO control depend on organizational breadth, which is of practical relevance. Second, varying organizational breadth further allows us to disentangle the effects of *Personalized Imposition of Control*, *Externality*, and the joint effect of *Hierarchical Distance* and *Pivotality*. This implies at the same time that variation in organizational breadth provides empirical insights into the potential relevance of the different channels.

To see why this is the case, note first that under CEO control, *Personalized Imposition of Control* increases as organizational breadth decreases. Applied to our treatments, CEO control is directed at one individual worker in Treatment 111, but at two separate workers in Treatment 122. Thus, the imposition of control is a weaker signal of personalized distrust in Treatment 122 than in Treatment 111. In contrast, the personalized imposition of control remains constant across treatments under Supervisor control: It is always one supervisor imposing control on one worker in a pair, independently of the treatment.

²² This design choice is simultaneously a feature and a potential confounding factor. However, our experimental design will allow us to control for the latter. Note also that keeping the return of the worker transfer to the CEO constant across treatments could equally be seen as confounding, as with this design choice the expected returns of the CEO would have been reduced.

Second, the *externality*, defined as the effect that a change in the worker transfer has on the party that did not impose control, is constant across treatments under CEO control: the marginal return of worker effort to the Supervisor's payoff is 2 in both treatments. However, the *externality* changes across treatments under Supervisor control, and decreases with organizational breadth: the marginal return of worker effort to the CEO's payoff is 2 in Treatment 111, but only 1 in Treatment 122.²³

An increase in organizational breadth is thus hypothesized to *increase* worker transfers under CEO control (due to reduced personalized imposition of control) and to *decrease* worker transfers under Supervisor control (due to the reduced externality). As a consequence, we hypothesize that CEO control becomes more effective (causes less negative behavioral reactions) than Supervisor control as organizational breadth increases.²⁴

3.1.1 Hypotheses

We use the data from Treatments 122 and 111 to test these additional hypotheses. To see how we construct the respective tests, recall that we elicit worker effort via the strategy method, and therefore we observe the following decisions from each participant:

- i) $e_{111}^{no\ control}, e_{111}^{SV\ control}, e_{111}^{CEO\ control}$ in Treatment 111
- ii) $e_{122}^{no\ control}, e_{122}^{SV\ control}, e_{122}^{CEO\ control}$ in Treatment 122.

First, we hypothesize a relationship between organizational breadth and the relative negative behavioral reactions to control under CEO control and SV control. In particular, an increase in organizational breadth reduces the personalized imposition of control and simultaneously reduces the externality, and both effects are hypothesized to increase the difference in worker transfers under CEO and SV control as organizational breadth increases. Empirically, we thus expect that

$$e_{122}^{CEO\ control} - e_{122}^{SV\ control} > e_{111}^{CEO\ control} - e_{111}^{SV\ control}.$$

Hypothesis 2 (Organizational Breadth). *CEO control becomes more effective than SV control, by causing a smaller negative behavioral reaction to control, as organizational breadth increases.*

Note that *Personalized Imposition of Control* is expected to impact worker effort under CEO control only, whereas *Externality* only affects transfers under SV control. Thus $\Delta^{CEO\ control} := e_{122}^{CEO\ control} - e_{111}^{CEO\ control}$ captures the effect of the change in Personalized Imposition of Control, and $\Delta^{SV\ control} := e_{122}^{SV\ control} - e_{111}^{SV\ control}$ captures the effect of the change in the Externality. However, $\Delta^{CEO\ control}$ and $\Delta^{SV\ control}$ also include potential differences in the general disposition of workers to transfer across the two treatments. As explained before, the social efficiency of a transfer is larger (by design) in Treatment 111. In addition, the time gap between the two treatments implies that the treatment randomization is not perfectly

²³ Note that externality need not naturally vary with organizational breadth. The variation in the return to the CEO was a deliberate design choice. Ultimately, it reflects the production function of the organization. However, we believe that the change in externality as modeled in our experiment is often plausible, since the impact of a worker's decision on the CEO is smaller in larger organizations, whereas its effect on his/her direct supervisor is arguably constant (as long as the size of the team supervised does not vary).

²⁴ *Hierarchical Distance and Pivotality* do not vary between treatments. We will later return to these channels and discuss how Treatment 111 allows us to separate the joint impact of these channels from the other two.

random. It is thus important to control for potential differences across the two treatments that are unrelated to the personalized imposition of control and the externality. Note that all these factors are also present in the *no control* condition. We can thus use the transfers in the *no control* condition to capture such differences. Notationally, $\Delta^{no\ control} := e_{122}^{no\ control} - e_{111}^{no\ control}$ captures the change in the disposition to transfer between the two treatments when no control was imposed.

To then test our second additional hypothesis on the *Personalized Imposition of Control*, we therefore use a Difference-in-Difference approach. Empirically, $\Delta^{CEO\ control} - \Delta^{no\ control}$ measures the effect of Personalized Imposition of Control only, filtering out differences in the disposition to transfer.²⁵

Hypothesis 3 (Personalized Imposition of Control). *The reduction of effort by the worker is weaker under CEO control than under no control when organizational breadth increases, that is, $\Delta^{CEO\ control} - \Delta^{no\ control} > 0$.*

Similarly, $\Delta^{SV\ control} - \Delta^{no\ control}$ isolates the effect of Externality on the behavioral reaction to control, which leads to our third additional hypothesis.

Hypothesis 4 (Externality). *The reduction of effort by the worker is stronger under Supervisor control than under no control when organizational breadth increases, that is, $\Delta^{SV\ control} - \Delta^{no\ control} < 0$.*

3.1.2 Procedures

Treatment 111 was run at the experimental laboratory of the University of Fribourg in February and March 2024, and 162 subjects participated in total. Procedures were similar to Treatment 122, which means that each participant assumed all three roles, using a within subject design. The role of the worker, which we are most interested in, was always the first that participants assumed. The experiment was again computerized using oTree (Chen et al. 2016), and subjects were recruited using ORSEE (Greiner 2015). Sessions lasted on average 45 minutes, and participants on average received 19.92 CHF (approx. 21 EUR) for their participation, including a 10 CHF show-up fee.

3.1.3 Results

Table 3 summarizes the workers' average and median transfer choices for No Control, Supervisor Control and CEO Control in Treatment 111.

As in Treatment 122, workers transfer significantly larger amounts when no control is exercised, independently of who exercises control. The observed differences are statistically significant for both comparisons (paired *t*-tests, $p < 0.001$). Therefore, we again observe hidden costs of control.

Table 4 provides workers' average transfers for all conditions in both treatments, as well as the differences in mean efforts between treatments that are needed to construct the difference-in-difference estimates outlined in Section 3.1.1.

To assess our first additional hypothesis—that CEO control becomes more effective than SV control as organizational breadth increases—we compare the difference in worker effort between CEO control and SV control across the two treatments, respectively

²⁵ Note that we need not control for the generalized disposition to transfer when assessing the effect of organizational breadth, as the differences that are compared with each other are always within one treatment, and thus the general disposition is automatically accounted for.

Table 3. Workers' average and median transfer choices in Treatment 111.

	Transfers	
	Average	Median
No control	26.15	30
Control by supervisor	20.15	15
Control by CEO	19.49	15

Table 4. Workers' average transfers and differences.

	Average transfer in 122	Average transfer in 111	Difference
No control	29.75	26.15	3.59 (0.06)
SV control	22.43	20.15	2.28 (0.13)
CEO control	24.33	19.49	4.84 (0.01)
$\Delta^{CEO\ control} - \Delta^{no\ control}$			1.24 (0.26)
$\Delta^{SV\ control} - \Delta^{no\ control}$			-1.31 (0.77)
$\Delta^{CEO\ control} - \Delta^{SV\ control}$			2.56 (0.01)

Notes: Numbers in brackets are p -values from paired t -tests.

$\Delta^{CEO\ control} - \Delta^{SV\ control}$. Effort under CEO control increases from 19.49 to 24.33, and thus by 4.84 points, as organizational breadth increases. Under SV control, effort increases from 20.15 to 22.43, and thus by 2.28 points. The difference-in-difference is 2.56 points, and this difference is statistically significant in a paired t -test ($p = 0.02$). Thus, personalized imposition of control and externality jointly impact the behavioral reactions to control, making CEO control more effective than SV control as organizational breadth increases. This leads us to our first additional result:

Result 4. *Organizational breadth exacerbates the difference in worker reactions to being controlled by different layers of the hierarchy.*

Next, we aim to decompose the respective contributions of *Personalized Imposition of Control* and *Externality* to the overall effect. As noted above, because we are now comparing effort levels across two different treatments, we need to control for changes in the general disposition to transfer across the two treatments, and thus assess these additional hypotheses using difference-in-difference estimates.

For *Personalized Imposition of Control*, we find that $\Delta^{CEO\ control} - \Delta^{no\ control}$ is 1.24, and thus positive, as expected. However, the difference-in-difference is not statistically significantly different from zero in a two-sample t -test ($p = 0.51$). Thus, while observed transfers under CEO control move in the hypothesized direction as organizational breadth increases, we cannot establish statistical significance of this effect.

Result 5. *A reduction of personalized imposition of control increases worker transfers, but the increase is not statistically significant.*

To assess the effect of *Externality*, we consider the difference in worker effort under Supervisor control in the two treatments, $\Delta^{SV\ control}$, and subtract the difference in transfers under no control to again control for differences in the general disposition to transfer across the two treatments. Thus, $\Delta^{SV\ control} - \Delta^{no\ control}$ captures the effect of *Externality* on the transfer when controlled. As hypothesized, once the general disposition is controlled for, we find that workers reduce their transfer under Supervisor control as the externality decreases (as organizational breadth increases): $\Delta^{SV\ control} - \Delta^{no\ control} = -1.31$. However, the difference is again not statistically significant ($p = 0.47$).

Result 6. *A reduction of the externality reduces worker transfers, but the reduction is not statistically significant.*

To summarize, we find that an increase in organizational breadth causes a significant increase in transfers under CEO control relative to Supervisor control, consistent with a joint impact of *Externality* and *Personalized Imposition of Control*. The observed total effect of a 2.56 point increase in the difference between worker transfers can be decomposed into roughly equal contributions of the two mechanisms (1.25 for *Personalized Imposition of Control* and 1.31 for *Externality*). However, statistical significance of the individual contributions of these individual mechanisms could not be established.

Finally, Treatment 111 also allows us to identify the joint effect of hierarchical distance and pivotality on worker transfers. To see why this is the case, note that in Treatment 111, there is no difference between CEO control and Supervisor control in terms of *Personalized Imposition of Control* and *Externality*. Consequently, these mechanisms cannot explain a differential effort response by the worker to CEO versus SV control. However, CEO and Supervisor still differ in *Hierarchical Distance* and *Pivotality*. In particular, the CEO is more distant and less pivotal than the Supervisor. Thus, we can assess the joint impact of these two mechanisms on worker behavior comparing *Control by Supervisor* with *Control by CEO* in Treatment 111. We find that the former tends to elicit transfers from the workers that are on average 0.65 points higher, but the difference is not statistically significant (paired t -test, $p = 0.18$).

3.1.4 Online experiment

Treatment 111 provided additional evidence on the joint relevance of personalized imposition of control and externality, but we did not obtain statistical significance for the individual contribution of each of these effects. In this respect, natural constraints on the sample size and thus statistical power were one limitation.

Hoping to overcome this drawback, we repeated our experiment with an online subject pool via Prolific. In one treatment, we matched the CEO with one supervisor–worker pair (Treatment O-111), whereas in the other treatment, we made a slight design adjustment and matched the CEO with four supervisor–worker pairs to increase organizational breadth even further (Treatment O-144). We collected observations from 198 and 199 participants, respectively.

Figure 3 displays the cumulative distributions of the workers' transfers in the two treatments. Table 5 summarizes the average and median transfers in the two treatments. The figure reveals a striking difference between the online sample and our laboratory sample: In both online treatments a much larger proportion of subjects provide a transfer at or below

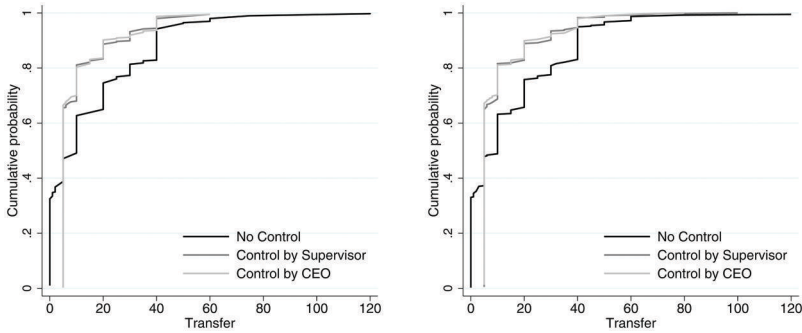


Figure 3. Cumulative distribution of workers' transfers in Treatment O-111 (left panel) and in Treatment O-144 (right panel).

Table 5. Workers' average and median transfer choices in Treatments O-144 and O-111.

	Transfers			
	O-144		O-111	
	Average	Median	Average	Median
No control	15.81	10	13.97	5
Control	10.64	5	10.42	5
by supervisor				
Control by CEO	9.83	5	10.72	5

5 points even without control compared to the lab treatment (53.54% in Treatment O-111 and 41.92% in Treatment O-144 versus 26.40% in Treatment 111 and 22.84% in Treatment 122). Similarly, the average and median transfers are much lower in the online treatments even without control (median of 5 in Treatment O-111 and 10 in Treatment O-144 versus 30 in Treatment 111 and 30 in Treatment 122). These numbers reflect a much less pronounced pro-sociality toward other members of the organization in the Prolific sample.²⁶

When controlled, about twice as many subjects chose the minimum transfer requirement in the online treatments compared to the lab treatments (more than 64% in both control conditions of both online treatments versus less than 35% in both conditions of both lab treatments). The fact that a large number of participants only contribute the minimum after being controlled greatly reduced our statistical ability to detect any differences between supervisor and CEO control, and indeed we could not find significant differences depending on who controls the worker, neither in O-111 nor in O-144 (paired t-tests, $p = 0.449$ for Treatment O-111 and $p = 0.186$ for Treatment O-144).²⁷ For these reasons, the online experiments proved unsuitable to further inform the relevance of the proposed mechanisms.

²⁶ One reason for this difference may simply be selection into the subject pool. A second important difference is a lack of control over the Prolific subject pool. In particular, we cannot control that participating subjects are not regularly deceived by other researchers, and thus we potentially lost control as to whether they believed in the payoff consequences of their actions on other real persons.

²⁷ Although, interestingly, in both treatments, we again observe significant negative reactions of workers to both types of control (paired t-tests, $p < 0.01$ for all comparisons).

4. CONCLUSION

In this article, we show, using a laboratory experiment, that workers' negative reactions to imposed control are significantly reduced if the control decision is taken by a hierarchically more distant superior rather than a direct supervisor. The results of our article are valuable to managerial decision makers. The trade-offs inherent in determining the optimal degree of centralization and the depths of corporate hierarchies are of fundamental importance for efficient organizational design. Previous research has identified several important determinants of the costs and benefits of centralization, such as information structure, the need for coordination, or the desire to shift blame. Our study adds to this debate by providing a rationale for retaining decisions over the level of control in the higher levels of the hierarchy.

Our study provides an experimental setup that can be used to further study control aversion in hierarchies. For example, in many real settings a CEO might only suggest a level of control to the supervisors, but leave the final decision to them. Relatedly, there might be organizations for which the payoff structure is different. Moreover, while we demonstrate the effects of two layers of hierarchies, it is an open question whether even more layers further mitigate the negative effects of control and potentially even erase them completely.

Finally, our results could also be relevant for applications outside the domain of managerial control decisions. For example, public authorities regulate and restrict citizen behavior—from speed limits to mask mandates during the COVID-19 pandemic. In some countries, these decisions are decentralized and delegated to lower levels of government, whereas other countries seek to retain these decisions in higher levels of government (for examples of the different approaches during the COVID-19 pandemic, see [Kuhn and Morlino 2021](#); [Vampa 2021](#)). It would be an interesting avenue for further research to better understand whether our finding that individuals react less negatively if controlling decisions are taken at higher levels of the hierarchy translates to the public domain, where individual restrictions are not meant to align incentives between a principal and an agent, but rather aim to internalize externalities to foster social welfare.

APPENDIX A

A.1 Additional analyses of workers' transfers

Table A1. Average differences between the workers' transfers.

	$x^{SC} - x^{NC}$	$x^{CC} - x^{NC}$	$x^{SC} - x^{CC}$
Average	-7.32	-5.42	-1.9
95% confidence interval	[-10.2, -4.45]	[-8.32, -2.54]	[-3.84, -0.35]

Notes: x^{NC} , x^{SC} , and x^{CC} denote transfers after No Control, Control by Supervisor, and Control by CEO, respectively. The second row reports the bias-corrected 95% bootstrapped confidence intervals based on 10^4 replications.

Table A2. Hurdle model without controls.

	Probability (1a)	Amount (1b)
No control (Constant)	0.92*** (0.10)	36.17*** (1.88)
Control by supervisor	-0.16*** (0.10)	-4.97*** (1.83)
Control by CEO	-0.16*** (0.10)	-1.88 (1.89)

(continued)

Table A2. (continued)

	Probability (1a)	Amount (1b)
Supervisor versus CEO (<i>p</i> -value)	0.828	0.014**
Controls	No	No
Observations	591	423
Cluster	197	169
<i>R</i> -squared	0.025	0.008

Notes: The dependent variable in regression (1b) is the size of the transfer by workers, whereas the dependent variable in regression (1a) is a dummy variable that equals 1 if workers transfer more than the MTR. Probability reports the marginal effects from a Probit regression calculated at the mean. Amount is the result of the linear regression truncated at the minimum transfer. Robust standard errors are clustered at the subject level and are reported in parentheses. Row “Supervisor vs CEO (*p*-value)” reports *p*-values from Wald tests comparing the coefficients for control by supervisor and control by CEO.

***, **, and * denote significance at 1%, 5%, and 10%, respectively.

A.2 Exertion of control

In this subsection, we examine the decisions of participants in the role of supervisors and CEOs. As Table A3 illustrates, a sizable fraction of CEOs (41%) and supervisors (37%) impose control. The proportion of supervisors and CEOs who exert control does not differ significantly (McNemar’s test, $p = 0.267$).

Table A3 also highlights the presence of 51 participants (26% of the sample) who exert control whenever they have the opportunity. We find that, when acting as workers, these controlling types make lower transfers. Thus, from a payoff-maximization perspective, their exertion of control is justified if they believe other workers act as themselves. Further information about workers’ average and median transfers depending on their control decision, when they later act as supervisors and CEOs, is reported in Table A4. It is possible to notice that these controlling types transfer very small amounts when no control is imposed and, as a result, their own average and median transfers increase when control is imposed on them. Therefore, a large fraction of workers with little intrinsic motivation provides a rationale for the imposition of control in an organization. These controlling types may be reminiscent of the power-hungry subjects in Pikulina and Tergiman (2020) who are willing to sacrifice their own payoffs in order to control others. Whether there is a connection between such intrinsic preferences for power and an

Table A3. Exertion of control by CEOs and supervisors.

	CEOs who do not control	CEOs who control	Total
SVs who do not control	94	30	124
SVs who control	22	51	73
Total	116	81	197

Table A4. Workers’ average and median transfer choices depending on their own control decision.

		Controlling	No controlling	Control only if CEO	Control only if SV
No control	Average	11.67	40.38	32.13	22.95
	Median	1	40	30	12.5
Control by SV	Average	16.12	26.67	21.47	20.23
	Median	5	25	17	12.5
Control by CEO	Average	16	27.7	27.77	24.55
	Median	5	28.5	27.5	17.5

Table A5. Average payoffs.

	No control	Control by SV	Control by CEO
Worker ($120 - x$)	90.25	97.57	95.67
Supervisor ($2x$)	59.50	44.86	48.66
CEO ($x_1 + x_2$)	59.50	44.86	48.66

individual's inclination to control is an interesting empirical question that we leave for future research.

We collect information on the participants' beliefs about the fraction of supervisors (out of 10) who chose to impose control when the CEOs left them free to decide whether or not to set the minimum transfer requirement. We find that subjects who expect a large fraction of supervisors exerting control are also more likely to exert control themselves as a CEO or as a supervisor (the correlation coefficients are 0.25 and 0.45, respectively), and react more negatively to control (the correlation coefficient in the case control is imposed by the supervisor is -0.17, while it is -0.13 if it is imposed by the CEO). Furthermore, we find that controlling types are more likely to expect others to exert control (the correlation coefficient is 0.41).

Finally, in Table A5, we report the average payoffs obtained by the participants. It is possible to observe that, to maximize their own payoffs: (i) supervisors, who get to decide, should not control; (ii) CEOs should delegate if they expect that their supervisors will not control. However, CEOs might be uncertain about the supervisors' decision. If a CEO believes that her/his supervisors will control, s/he is better off imposing control directly. Precisely, if the probability that supervisors control is larger than 74%, it would be beneficial for CEOs to control. Indeed, we find that almost 60% of the participants who exerted control when acting as CEOs believed that at least 8 out of 10 supervisors would impose control.

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