Authority versus Persuasion

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Managers often face a choice between authority and persuasion. In particular, since a firm's formal and relational contracts and its culture and norms are quite rigid in the short term, a manager who needs to prevent an employee from undertaking the wrong action has the choice between either trying to persuade this employee or relying on interpersonal authority.[1] Simon (1947) noted, for example, that 'when ... disagreement is not resolved by discussion, persuasion, or other means of conviction, then it must be decided by the authority of one or the other participant' and that 'in actual practice [...] authority is liberally admixed with suggestion and persuasion.' Obviously, in choosing between persuasion and authority the manager makes a cost-benefit trade-off. This paper studies that trade-off, focusing in particular on agency conflicts that originate in open disagreement, in the sense of differing priors.

To that purpose, I will study a setting in which a principal and an agent are involved in a project. The project's outcome depends on decisions by both the principal and the agent and also depends on complementary private effort by the agent. A key issue is that the principal and agent may openly disagree on which decisions are most likely to lead to a success, even though no player has private information, i.e. the players have differing priors. For such setting, Van den Steen (2002, 2004) and, independently, Che and Kartik

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[1]Interpersonal authority can be defined as 'the right or power to give orders and enforce obedience' (Fayol 1916). Arrow (1974) stated that 'the giving and taking of orders ... is an essential part of the mechanism by which organizations function' while Simon (1947) observed that '(o)f all the modes of influence, authority is the one that chiefly distinguishes the behavior of individuals as participants of organizations from their behavior outside such organizations.'

(2007) showed that open disagreement gives rise to persuasion in a very natural way: each player believes that new information will confirm her prior and thus 'persuade' the other. It is exactly this type of persuasion that I will study here.[2] Apart from such persuasion by collecting new information, I will also allow the principal to impose interpersonal authority, i.e., to make it costly for the agent to disobey an order of the principal. The sources of such interpersonal authority in a setting with open disagreement were studied in Van den Steen (2007), which showed that a firm, with its low-powered incentives and asset ownership, may be an important vehicle to convey authority to a principal. In this paper, I will use a reduced form that simply imposes a cost on the agent if he disobeys the principal.

Probably the most important result of this paper is that the principal will rely more on persuasion for projects with a high need for motivation or effort. The reason is that – under the assumption that effort is a complement to correct decisions, i.e., that effort on a good project is more valuable than effort on a bad project – the agent will exert more effort if he believes more in the project. From the manager's perspective that implies that persuasion will motivate the agent. This makes, on its turn, persuasion more attractive on projects where effort or motivation are more important.

Since persuasion can cause compliance even in the absence of authority, it seems that an increase in persuasion should lead to a decrease in the reliance on authority. This is only partially true, however: persuasion and authority can be both substitutes and complements. In particular, I will show that authority and persuasion are substitutes when authority is highly effective but complements when authority is not very effective. To see why, note that if authority alone is not sufficient to make the agent comply but the combination of authority and persuasion is, then authority is more attractive in the presence of persuasion

[2]There is another natural form of persuasion in a context with differing priors. Suppose that players with differing priors may also have private information. The combination of information and priors makes observing others' beliefs insufficient to infer their private information. Communication of private information may then serve to 'persuade' others. As shown in Van den Steen (2004), players will want to communicate information that confirms their belief to 'persuade' the other and will want to hide information that contradicts their beliefs. Obviously, weak attempts at 'persuasion' will be interpreted as a negative signal. But in the context of this paper's model, persuasion would again lead to motivation.

and vice-versa. In the other extreme, if each is sufficient to induce (some) compliance, then persuasion becomes less attractive in the presence of authority and vice versa, because some of the potential benefits have already been realized by the other. The earlier results on persuasion and motivation then imply that, when authority is very effective, the principal will rely less on authority for projects where effort or motivation is more important. Finally, authority and persuasion being substitutes also implies, from the perspective of the principal, a trade-off between motivation and cooperation. This trade-off is recognized as one of the fundamental issues in organization design (Roberts 2004).

A further result is that the principal will rely more on persuasion (without authority) when agents have strong pay-for-performance incentives. The reason is that incentives and confidence in the project work multiplicatively. Finally, there is also a positive relationship between the confidence of the principal and the use of persuasion if either authority is weak or effort is important. This is caused by the fact that a more confident manager believes that persuasion will be more effective, making it more attractive in her eyes. The reason why this relationship does not hold everywhere is that a more confident manager also cares more about the employee choosing the (subjectively) 'correct' action, which can make authority more attractive when effort is unimportant.

Apart from the work mentioned above, this paper is also related to a number of strands in the literature. The first is work on persuasion, such as Milgrom (1981), Crawford and Sobel (1982), Milgrom and Roberts (1986), or Dewatripont and Tirole (1999), and work on belief formation, such as Benabou and Tirole (2006) or Benabou (2008). The second is work that compares different modes of decision making related to authority and persuasion such as Aghion and Tirole (1997) or Dessein (2007). Furthermore, Benabou and Tirole (2002) also studied the connection between confidence and motivation, although they study confidence about one's own abilities rather than confidence about the quality of a project. These two are not unrelated, however: skill and project quality both affect how effort translates into output. That relationship is reflected in the fact that both papers's results are affected by

whether effort is a complement to – versus a substitute for – skill or project quality. The two do have very different interpretations and very different implications, however. Finally, the mechanism for motivation in this paper is also related to the result in Van den Steen (2006) that delegation motivates an agent when principal and agent disagree on the optimal course of action. The difference between that paper and the current model is obviously that in this paper motivation gets induced by persuasion rather than by delegation.

The next Section lays out the model. Section 2 presents the results while Section 3 concludes. All proofs are in the online appendix.

1 Model

Consider a setting in which an agent executes a project for a principal. The project will be either a success or a failure. A success gives the principal and the agent respective payoffs $\gamma_P, \gamma_A \geq 0$ while their payoffs upon failure are normalized to 0. The project's probability of success (Q) depends on two decisions (D_1 and D_2) and on effort (e) by the agent. The effort $e \in [\,0, 1\,]$ is chosen by the agent at private cost $c(e)$, specified below. Each decision D_k is a choice from the set $D_k \in \{X, Y\}$, one and only one of which is correct as captured by the state variable $S \in \{X, Y\}$, which is the same for both decisions.

The state S is unknown, but each player i has a subjective belief about S. A key assumption is that (it is common knowledge that) players have differing priors, i.e., they can disagree about S even though neither has private information.[3] Since the players may have differing priors but have no private information about S, they will not update their beliefs when they meet someone with a different belief: they simply accept that people sometimes disagree. To keep the analysis simple, I will immediately assume that the principal and the agent disagree on S. In particular, it is common knowledge that the principal believes that

[3]See Morris (1995), Yildiz (2000), or Van den Steen (2007) for more discussion of differing priors.

$S = X$ with probability $\nu_P > .5$ while the agent believes that $S = Y$ with probability $\nu_A > .5$.[4] Note that the ν_i are the players' confidence in their beliefs.

With $d_k = I_{D_k=S}$ the indicator function that decision D_k is correct and with $\alpha, \beta \geq 0$ (with $\alpha + \beta < 1$) parameters that capture the importance of pure decision making and of effort, the probability of success equals $Q = \alpha d_1 + \beta d_2 e$. Note that the agent's effort is complementary to D_2: effort is more valuable on good projects than on bad projects, an assumption that I will discuss below. To simplify the analysis (considerably), I will also make Q additively separable in the agent's decision and effort, by letting D_1 be chosen by the agent and D_2 by the principal.[5] This can also be interpreted as both decisions being chosen by the agent but the principal getting free and full compliance on D_2.

The timing of the game is very simple. First, in period 1, the principal can try to convince the agent by drawing, at a private cost c_p, a signal about the state of the world. The drawing and the signal itself are publicly observed. The signal is commonly known to be correct with probability p. At the same time with her decision to draw a signal or not, the principal also decides whether to exert interpersonal authority. Exerting interpersonal authority, which comes at a private cost c_a to the principal, makes it costly for the agent to undertake an action against the will of the principal. In particular, the agent will incur a private cost c_d from choosing Y rather than X, i.e., from 'disobedience.'

In period 2, once the principal has decided on authority and persuasion, both the agent and principal (again simultaneously) choose their actions: the principal chooses D_2 while the agent chooses D_1 and e. The cost of effort to the agent equals $c(e) = \beta\frac{e^2}{2}$. The (only) reason to normalize effort by β is to make very clear that the results are not driven by the fact that effort would become cheaper (on a relative basis, in the absence of this normalization) when

[4]This assumption is made to simplify the model. See Van den Steen (2007) for a setting where the beliefs are private information, the principal gives an 'order', and 'disobedience' is disregarding the order. The results of this paper would extend to such a context.

[5]Nearly identical results can be obtained in a similar setting with $Q = [\alpha d_1 + \beta e]d_2$ and independent decisions. In that case, the principal's decision is a complement to the agent's full productivity. The main results also seem to hold with the original Q, all decisions chosen by the agent, and costly and imperfect interpersonal authority, but at the cost of a considerable increase in complexity. See Rosen (1982) for a motivation why the principal's decision and the agent's effort would be complements.

the part that depends on effort becomes more important. The decisions are non-contractible and each player is free to choose any decision he or she wants, taking into account the private and public costs and benefits.

In period 3, the state is revealed and the project outcome is realized. The players then get the benefits γ_A and γ_P upon success. No further contracting on outcomes or payoffs is possible, so that these payoffs are completely exogenously given. All players are risk-neutral and thus simply maximize the expected value of their project payoffs minus any private costs.

In terms of parameters, I will assume that $\nu_P > \nu_A$ and $\nu_P > p$. The first ensures that the principal will always follow his own beliefs while the second ensures that the signal never changes the principal's mind. These assumptions exclude some cases that, while sometimes interesting in their own right for different reasons, do not contribute to the analysis of this paper. To simplify the statements and analysis, I will also assume that when indifferent each player does what the other prefers, not only on the action choice but also for persuasion and authority. That implies that the principal will use persuasion when indifferent but will not use authority when indifferent. Finally, all costs are non-negative.

2 Results

Let me start by showing that authority and persuasion are complements when interpersonal authority is not very effective and substitutes when it is very effective. To state this formally, remember that exerting interpersonal authority implies that the agent incurs a cost c_d when going against the principal's beliefs. The agent is thus more likely to obey when c_d is higher, so that c_d is a good measure for the effectiveness of authority. The following Proposition then captures the result.

Proposition 1 *Authority and persuasion are complements when* $c_d < \alpha\gamma_A(2\nu_A - 1)$ *and substitutes when* $c_d \geq \alpha\gamma_A(2\nu_A - 1)$.

The intuition is fairly straightforward. If the manager's interpersonal authority is so weak that the employee would not obey authority at his original belief, then persuasion may actually move his beliefs sufficiently to get him to comply (at least some of the time). In that case, the use of persuasion makes authority more effective and thus more attractive and more likely. In the other direction, the use of authority then creates an additional benefit from persuasion, making persuasion also more likely. Authority and persuasion are thus indeed complements when authority is not very effective.

Consider, on the other extreme, the case that the manager's interpersonal authority is so strong that the agent will always obey. There are now two different mechanisms (in different parts of the parameter space) that can cause authority and persuasion to be substitutes. First, if persuasion is sufficiently strong so that it can change the opinion of the agent (when the signal confirms the principal's belief), then persuasion not only improves motivation but also induces some compliance. The use of authority eliminates the second benefit and thus reduces the attractiveness of persuasion. In the other direction, the use of persuasion also reduces the attractiveness of authority since it reduces the amount of extra compliance that comes from exerting authority. It thus follows that authority and persuasion are substitutes. But there is a second way in which they can be substitutes. In particular, when collecting information to persuade the agent, it will sometimes happen that the extra information disconfirms the principal's views and thus moves the agent further away from the principal's view. In fact, it will then sometimes happen that an agent who would have obeyed absent any attempt at persuasion becomes so convinced of his views that he will not obey any more after this failed attempt at persuasion. Persuasion then weakens the principal's authority. This makes persuasion less attractive in the presence of authority (since it can now have a negative effect) and authority less attractive in the presence of persuasion (since it is less effective). Authority and persuasion are thus again substitutes.

The non-symmetric nature of the result, i.e., the fact that the effectiveness of authority plays a role but not the effectiveness of persuasion, may be slightly surprising. This seems

to be partially due to the way that persuasion is conceptualized here. In particular, it seems that persuasion along the lines of footnote 2 would result in a more symmetric result. This, and especially its further implications, seems an interesting direction for future research.

I now turn to the most important result of the paper: that the manager will use more persuasion when employee effort or motivation is more important.

Proposition 2 *The set of parameters for which the principal uses persuasion increases in* β*. The set of parameters for which the principal uses authority decreases in* β *if* $c_d \geq \alpha\gamma_A(2\nu_A - 1)$*.*

The intuition is that, with effort complementary to making the right decisions, persuading the agent will increase his effort or motivation. When effort becomes more important, the payoff from persuasion increases, so that persuasion will indeed be used more. The negative effect on authority when authority is relatively strong is caused by the fact that the two are substitutes in that case.

This result relies on the assumption that effort and decisions are complements, i.e., that effort is more valuable on good projects than on bad projects. (The case with substitutes is not analyzed here, but I conjecture that the result would go the other way.) This obviously raises the question whether it is indeed the case that effort and decisions are complements. One way to approach this issue is to distinguish 'implementation/execution' effort from 'corrective' effort, with the one being typically a complement and the other a substitute. The results would then apply to execution and implementation effort, which seems to be more prevalent. However, unless these two can be distinguished empirically, that only redefines the question. A more direct indication is the work of, among others, Rosen (1982) and Kremer (1993) who argued that there will be complementarities among worker (or managerial) productivities and provide empirical evidence supporting this. In fact, Rosen (1982) explicitly assumes that the quality of a manager's decision affects the output of employees multiplicatively, as in this model.

An interesting implication of this result is that there is, in the manager's eyes, a trade-off between motivation and cooperation when authority is very effective, as is clear from a graphical representation of the equilibria. This trade-off is a well-known issue in organization design (Roberts 2004). Other explanations of this trade-off include Athey and Roberts (2001), Dessein, Garicano, and Gertner (2005), and Van den Steen (2006). As pointed out elsewhere, sorting on beliefs ('hiring for fit') may often resolve this conflict.

A closely related result is that the manager will rely more on persuasion by itself when the agent has higher incentives γ_A. The reason is that higher incentives imply a higher base-level of effort and thus a stronger effect of persuasion. To say it in a more intuitive way: persuading someone who is indifferent about the outcome has very little effect.

Proposition 3 *The set of parameters for which the principal uses persuasion by itself increases in* γ_A.

The reason why this result only holds for 'persuasion by itself' is that a change in γ_A may also affect under which conditions the agent obeys. This may, on its turn, affect the area where the principal uses both authority and persuasion through very different mechanisms. The results would hold for persuasion in general when conditioning on 'no change in obedience.'

One would also expect a more confident manager to rely more on persuasion. In particular, a more confident principal believes more strongly that he will be able to persuade the agent, resulting in increased effort by the agent and potentially also in increased compliance. That should make persuasion more attractive. There is, however, a counter-acting effect: a principal who is more confident about the right course of action will care more about making sure that the agent follows that course of action. Since persuasion generates at most partial compliance, a more confident principal may therefore also want to use more authority. This can make the result go the other direction when authority and persuasion are substitutes. It turns out, however, that the result does hold either when authority is weak or when effort is important (in a relative sense):

Proposition 4 *When $c_d < \alpha\gamma_A(2\nu_A - 1)$ then the set of parameters for which the principal uses persuasion increases in ν_P. When $c_d \geq \alpha\gamma_A(2\nu_A - 1)$, then there exists an $\epsilon \geq 0$ (which may be function of all parameters but α and β) such that the set of parameters for which the principal uses persuasion increases in ν_P when $\beta/\alpha > \epsilon$.*

3 Conclusion

This paper studies a setting with open disagreement where a principal can use authority or persuasion to get compliance, but also cares about the agent's effort.

The main result is that a principal will rely more on persuasion for projects with a high need for (implementation) effort. It also showed that persuasion and authority are complements when authority is relatively ineffective but substitutes when authority is very effective. This may provide a partial explanation for the well-known motivation-cooperation trade-off. Finally, the principal will also rely more on persuasion (without authority) when agents have higher pay-for-performance incentives.

The paper focused on persuasion by means of collecting new information, but also pointed to persuasion mechanisms by means of existing information. This seems to be an interesting avenue for future research.

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