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13 June 2018

Online at <https://mpra.ub.uni-muenchen.de/94459/>

MPRA Paper No. 94459, posted 18 Jun 2019 02:07 UTC

Managing Employees 'Insides' to Remedy Agency Problems? A Model of Transformational Leadership

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June 13, 2019

Abstract

We consider a leader who can choose between a transactional or a transformational style of leadership to motivate a team of followers, in presence of moral hazard and free riding. Transformational leadership extends transactional leadership by allowing the leader to deliver a motivational message in addition to standard monetary incentives. When followers adhere to the leader's message, they get more motivated and exert more effort. We show that there is a complementary between monetary incentives and the motivational message. Furthermore followers are better off under transformational leadership. We also show that when the team size increases, transformational leadership - even if it comes at a fixed implementation cost - becomes less and less profitable for the leader compared to transactional leadership, at least when the size increase does not reinforce too much the social incentives to adhere to the leader's vision. When the size increase makes social incentives sufficiently stronger, transformational leadership regains interest and can even remedy the free-riding and moral hazard problems. Our results are in line with the empirical literature on leadership.

JEL codes: D2, D8, D9, M5.

KEYWORDS: leadership, teams, agency problems, incentives, motivational message.

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"The modern business of management is often managing the 'insides' - the hopes, fears, and aspirations - of workers, rather than their behaviors directly" (Deetz, 1995).

1 Introduction

Every year, the newly hired employees of Gentle Giant, a Massachusetts moving company, participate in a "stadium run" during which they have to run up and down the 37 sections of Harvard stadium, encouraged by other employees. This hard physical challenge is followed by a breakfast and an orientation speech from the CEO of the company, Peter O'Toole. By organizing this event, the company delivers the message that effort, sense of challenge, solidarity and teamwork should be essential parts of employee values at work.

Since the 1980s, leadership and management ideas have incorporated "soft" aspects both at practical and theoretical levels. With the advent of "organizational culture", "employee development", "employee empowerment" and "team building", leadership has been willing to alter the way employees perceive, understand and value the tasks they perform, how they feel related to their workgroup, and how they identify with the organization and its objectives. In the terminology of Bass (1985, 1990), leadership has switched from a transactional conception, in which employees exert effort in exchange of a monetary reward, to a transformational conception, in which in addition to money, leaders articulate a vision through a motivational message in order to raise employees' aspirations and make them exert effort beyond what is typically expected in a transactional context. Transformational leadership notably often emphasizes the leader's vision as a basis for group identity: Followers adhere to the message because they value joining a shared experience and derive meaning from being linked to a collective (Shamir, House and Arthur, 1993 ; Ashforth and Mael, 1989). In other words, there are social incentives to endorse the leader's vision.

In this article, we propose a formal framework to analyze the transactional and transformational styles of leadership through the lenses of incentive theory. What vision should the transformational leader articulate to obtain follower adherence? How to combine monetary incentives, social incentives, and the motivational message to better motivate employees? Does

the transformational style allow to remedy problems like moral hazard or free riding that are typical of the transactional style? Does the transformational style benefit followers?

The literature on leadership has identified several types of messages available to a transformational leader to raise employees' aspirations (Bass, 1985 and 1990). First the leader can provide more meaning and purpose to employees by explaining how their individual work contributes to the functioning of the overall organization. Employees are more motivated when they know how they fit into the big organizational picture. To enrich the task meaning, the leader can notably communicate a joint purpose to followers by stating 'who we are', 'what we do and why' and 'what we value'. Second, the leader can give more autonomy to employees, foster their initiative, and encourage them to tackle old problems in new ways. Third, the leader can act as a role model for the employees by maintaining high standards of conducts and backing up talk with action. Fourth, the leader can provide more attention to employees, listen to their needs and concerns, and express gratitude when work is done.¹

From a behavioral point of view, transformational leadership acts on followers' identity. Generally speaking, an individual's identity answers the questions of who, what, where, and why the individual is.² Through the motivational message, the transformational leader creates a narrative that helps followers to position more clearly their identity with respect to the tasks they perform, the team they belong to, and the entire organization. Work becomes more meaningful for followers and their intrinsic motivation to exert effort increases.³ A consequence is that transformational leadership is typically associated with higher levels of employees' effort, well-being and job satisfaction (e.g., Arnold, Barling, Kelloway, McKee, 2007). Clearly, followers are not passive consumers of managerially designed identities: they are more willing to adhere to the leader's motivational message if it is compatible with their initial values regarding work. Furthermore, followers are more inclined to adhere when they perceive that the message is addressed to a group of people, also inclined to accept. Indeed, followers may value being part of a new stimulating shared experience and derive more meaning from being

¹Transformational leadership is close to the concept of "Identity regulation", a mode of control that is "accomplished through the self-positioning of employees within managerially inspired discourses about work and organization with which they become more or less identified and committed" (Alvesson and Willmott, 2002:620).

²One can also talk of "self-concept".

³See Cassar and Meier (2018) for a survey about meaning as a source of intrinsic motivation for employees.

linked to a group (Ashforth and Mael, 1989).⁴ Furthermore, a larger number of adopters may reduce the uncertainty inherent to adherence (e.g., Hogg and Mullin, 1999). Finally, a larger group may accentuate the conformity effects or the peer pressure effects acting on followers.⁵ Transformational leadership is not equally effective in all contexts:

- It is more effective in small or medium firms than in more complex organizations (Ling, Simsek, Lubatkin, and Veiga, 2008).
- It is more effective in teams higher in “power distance” (acceptance of hierarchy) and “collectivism” (strength of the ties that people have to others within their community) (Robbins and Judge, 2013).
- It is more effective when the motivational message is used in conjunction with high monetary incentives (Kvaløy, Nieken, and Schöttner, 2015 ; Ichniowski and Shaw, 2003).

In this paper we modelize the leader-follower(s) relationship using a principal-agent(s) framework. The leader can choose either a transactional or a transformational style of leadership to motivate a team of followers. Under transformational leadership, the leader seeks to alter the followers’ values and attitudes regarding work by delivering a motivational message, which entails a certain cost to implement. The first contribution of this article is to offer a conceptual framework to understand how the followers’ decisions to adhere to the leader’s vision and their effort levels are affected by the interplay between monetary incentives and the two types of non-monetary incentives associated with transformational leadership, namely the motivational message and the social incentives. Are the incentives substitutes or complements? Do followers benefit when the leader implements a transformational style of leadership? The second contribution consists of characterizing the parameters that determine the leader’s choice between the transactional and transformational styles. Notably, what is the role played by the size of the team? Third, the relationship between the leader and the followers under transactional leadership is subject to typical agency problems like limited liability, moral hazard and free

⁴Psychologists talk of “group identity” to refer to a person’s sense of belonging to a group.

⁵As in the Gentle Giant example of the “stadium run”, the leader can reinforce the social incentives to adhere by making clear that the motivational message is addressed to a large group of employees. He or she can also engage in the rhetorical use of “we” and “us” to foster the group identity (Steffens and Haslam, 2013). We will come back to this point later.

riding, that reduce the ability of the leader to align the followers' actions on his or her own objectives and reach first-best efficiency. Is transformational leadership, by allowing the leader to deliver a motivational message, able to remedy agency problems and get closer to first-best efficiency? Fourth, followers may have different initial levels of intrinsic motivation. For the leader, the question becomes to know which follower(s) to target with the motivational message. Should the leader deliver an ambitious vision only aimed at followers with the highest initial intrinsic motivation? Should the leader deliver a less ambitious vision to which more followers will adhere?

To address these questions we construct a model where the principal (the “leader”) employs a team of agents (“followers”) to work on a joint project. The leader cannot observe the effort levels exerted by followers. Each follower is characterized by an initial level of intrinsic motivation. The leader can either use a transactional or a transformational style of leadership. Transactional leadership is used as a benchmark case and relies on standard monetary incentives. Transformational leadership goes beyond transactional leadership by adding the possibility for the leader to deliver a motivational message to followers, at a given fixed cost, F . Each follower can adhere or not to the message. There is a psychological cost to adhere that is increasing in the difference between the initial intrinsic motivation of the follower and the effort level associated with the message. However, there is also a benefit to adhere because embracing the leader's vision provides meaning to the follower and induces a higher intrinsic motivation. The follower adheres to the message when the benefit outweighs the cost of adherence. In this case, he or she becomes more motivated and exerts more effort. We obtain three main results that are consistent with the stylized facts about transformational leadership.

The first result states that under transformational leadership, the motivational message and monetary incentives are complements: a follower adheres to a motivational message distant from his or her initial intrinsic motivation when monetary incentives are sufficiently high. Furthermore, for a given level of monetary incentives, the highest motivational message that followers are ready to accept also depends on the size of the team. We consider two cases. In the first case, the social incentives to adhere are not or little affected when the team gets larger. In this situation, when the team size increases, the leader has to deliver a motivational message more congruent with followers' initial intrinsic motivation (that is, a less ambitious

vision) to obtain their adherence. This result is due to a *transformational free-riding effect*: A follower is less willing to incur the cost of adherence if he or she knows that other followers will adhere to the message and exert more effort. The transformational free-riding effect differs from the standard (transactional) free-riding effect due to team production, but is also stronger when the number of followers increases. The second case corresponds to the situation where social incentives to adhere increase strongly when the team gets larger. In this case the extra social incentives outweigh the stronger transformational free-riding effect and followers accept to endorse a motivational message that is more distant from their initial intrinsic motivation.

Second, we compare the followers' utility and the firm's profit under the two styles of leadership. We show that followers are better off under transformational leadership because of the higher levels of monetary incentives and intrinsic motivation. Regarding profits, we characterize the range of values of the cost F such that the leader prefers transformational leadership over transactional leadership. We show that the area associated to transformational leadership is larger when followers' initial level of intrinsic motivation is low: the motivational message helps mobilize less engaged workers. When the team size increases but social incentives to adhere are not or little affected, we show that implementing transformational leadership becomes progressively less profitable for the leader than transactional leadership. This result may come as a paradox given the fixed nature of the cost F incurred by the leader to implement transformational leadership. In fact it is a consequence of the transformational free-riding effect. When social incentives to adhere increase sufficiently as the team gets larger, transformational leadership becomes at first more attractive than transactional leadership when the number of team members grows. The reason is that the stronger social incentives make adherence to the leader's message easier, which outweighs the transformational free-riding effect. However beyond a certain team size, transformational leadership may again become less interesting than transactional leadership for the leader if social incentives reach an upper bound. Nevertheless, when social incentives keep growing sufficiently strongly with the team size, we show that transformational leadership is able to remedy the free-riding effect, and can even allow to reach the first-best optimum associated with the transactional framework. In this polar case, social incentives to adhere to the leader's vision have to be so strong that we refer to this type of transformational leadership as "charismatic".

Third, we consider the case of a team of two followers with different initial levels of intrinsic motivation. The question becomes now for the leader to know which employee(s) to target and convince through the motivational message. We show that the leader's message targets the two employees when their initial levels of intrinsic motivation are not too different.

There is a burgeoning theoretical literature in economics that studies how an organization can alter the preferences of its employees through its leadership or management style. Rotemberg and Saloner (1993) show that, when contracts are incomplete, the empathy of the leader toward followers can improve their incentives to engage in innovative activities and can increase profits in contexts where innovation opportunities are numerous. Akerlof and Kranton (2008) study the problem of a firm that faces a moral hazard problem regarding workers' effort. The firm can either decide to monitor workers closely or more loosely. Monitoring workers closely allows to detect shirking more easily, but reduces their intrinsic motivation to work because identification with the organization becomes more difficult. Akerlof and Kranton characterize the circumstances under which the firm prefers less supervision. Kvaløy and Schöttner (2015) consider a motivator who can exert a costly motivational effort to reduce the effort costs of a worker, and analyze the optimal combination of motivational effort and monetary incentives. They show that money and motivation can be substitutes or complements. Furthermore, the motivational effort may exceed the efficient level. Donze and Gunnes (2018) develop an agency model in which employees have both a personal and a social ideal of effort. The firm does not observe the personal ideals but can make employees more sensitive to the social ideal by fostering social interaction in the workplace. They show that the firm invests in social bonding to reinforce the effectiveness of monetary incentives and to reduce the adverse selection problem, by making employees more similar. Another part of the literature on leadership sees the leader as the agent who possesses a superior information compared to the others. In this vein, Hermalin (1998) considers a team leader who has some private information about the value of a joint project and can exert an observable effort before the other team members. Hermalin shows that the leader leads by example: effort acts as a signal that reveals the value of private information. Van den Steen (2005) shows that a leader with a vision, defined as strong beliefs about the right course of action, attracts employees with similar beliefs, through sorting in the labor market. It may be optimal for a firm to hire such a leader, notably when uncertainty is

high and actions are difficult to contract on.

Our work differs from previous works in two aspects. First we do not only consider the case of a single follower but also the case of a team of followers. This allows us to highlight the impact of the team size and the strength of social incentives on the choice of the leadership style. When social incentives are little affected by the size, transformational leadership becomes less profitable than transactional leadership as the team size increases. When social incentives are strongly and positively affected by the team size, transformational leadership becomes more and more profitable compared to transactional leadership and can even solve agency problems. Our framework therefore explains why transformational leadership emphasizes the importance for the leader of a large team to construct a group-oriented vision to which their followers can identify: creating a group identity and strong social incentives to endorse the leader's vision is a necessary condition to make transformational leadership successful. Second, we allow each follower not to endorse the leader's vision if this vision is too far from the follower's initial intrinsic motivation. In our context, followers are not passive consumers of organizational identities, but have to be convinced by both the message, the monetary incentives and the social incentives to adhere to the vision. This leads us to highlight the concept of transformational free-riding. The interplay between the transformational free-riding effect and the social incentives constitutes a key determinant of the leader's choice of leadership style.

The article is organized as follows: In section 2, we modelize the transactional and the transformational styles of leadership. In section 3, we solve the model and determine the optimal style of leadership when followers are identical. In section 4, we consider the case of two heterogeneous followers. Section 5 concludes.

2 The model

We follow the literature on leadership and refer to the principal as “the leader” and the agents/employees as “the followers”.

The framework. A risk neutral leader ("she") employs a team of n risk neutral followers (each of them referred to as "he") to work on a common project. Follower i exerts an effort level $e_i \in [0, 1]$. The leader cannot observe the effort levels, which induces a moral hazard

problem. The project is successful with probability $\bar{e} \equiv \frac{\sum_{j=1}^n e_j}{n}$, in which case it yields the payoff $Y(n)$. We will mainly deal with the case of constant returns to scale: $Y(n) = ny$ (for a given $y > 0$), but will also evoke the case of increasing and decreasing returns to scale in subsection 3.5. The project fails with probability $1 - \bar{e}$, in which case it yields the payoff 0. At the beginning of the game, the leader can choose between two styles of leadership: *transactional* or *transformational*. We assume that the leader faces important transaction costs and thereby proposes the same compensation scheme to all followers.⁶

Transactional leadership. It is denoted by subscript a . Under transactional leadership, the leader proposes the compensation contract (s_a, b_a) to each of the n followers, where s_a is the base salary, and b_a is the bonus paid when the project is successful. We assume that followers have no initial wealth and cannot borrow on the imperfect financial market. The consequence is that the leader is subject to a limited liability constraint, $s_a \geq 0$ and $b_a \geq 0$. If follower i refuses the contract, he gets his reservation utility, which we assume equal to zero. In this case, we set $e_i = 0$. If follower i accepts the contract, he exerts effort along with the other followers, and the production and the payments are realized, conditional upon the project outcome (success or failure). Follower i 's (expected) utility is defined as

$$\begin{aligned} U_{i,a} &= \bar{e} \left(s_a + b_a - \frac{1}{2}c(e_i - \hat{e}_i)^2 \right) + (1 - \bar{e}) \left(s_a - \frac{1}{2}c(e_i - \hat{e}_i)^2 \right) \\ &= s_a + \bar{e}b_a - \frac{1}{2}c(e_i - \hat{e}_i)^2 \end{aligned} \tag{1}$$

where $c > 0$. We assume that utility is separable in revenue and cost. The shape of the cost function $\frac{1}{2}c(e_i - \hat{e}_i)^2$ conveys the idea that follower i has an initial level of intrinsic motivation, \hat{e}_i , which corresponds to the effort that i exerts when the bonus is nil, but the base salary is sufficiently high to ensure that the participation constraint is satisfied.⁷ The higher (resp. the lower) the initial personal intrinsic motivation, the lower (resp. the higher) the marginal cost

⁶This assumption does not change anything when followers are identical (section 3) but makes a difference when followers are heterogeneous (section 4). See Benabou and Tirole (2016) or Donze and Gunnes (2018) for the case where a firm uses a menu of contracts to screen employees according to their initial intrinsic motivation.

⁷Holmström and Milgrom (1991) consider the same kind of cost function to modelize intrinsic motivation.

of effort. Formally, we have

$$\frac{\partial \left(\frac{1}{2} c (e_i - \hat{e}_i)^2 \right)}{\partial \hat{e}_i} = -c < 0 \quad (2)$$

The leader's (expected) profit is

$$\begin{aligned} \pi_a &= \bar{e} (ny - nb_a - ns_a) + (1 - \bar{e}) (-ns_a) \\ &= \bar{e} (ny - nb_a) - ns_a \end{aligned} \quad (3)$$

Transformational leadership. It is denoted by subscript f . Under transformational leadership, the leader offers a compensation contract (s_f, b_f) and articulates a vision $v_f \geq \hat{e}$. Her objective is to alter the initial intrinsic motivation of followers. We assume that the leader's vision is expressed in units of effort. If follower i refuses the contract, he gets his reservation utility, which we assume equal to zero. In this case, we set $e_i = 0$. If follower i accepts the contract, he can adhere to the leader's vision or not. The leader does not observe whether follower i has adhered or not. The (expected) utility of follower i reads

$$U_{i,f} = \begin{cases} s_f + \bar{e}b_f - \frac{1}{2}c(e_i - \hat{e}_i)^2 & \text{if } i \text{ does not adhere to } v_f \\ s_f + \bar{e}b_f - \frac{1}{2}c(e_i - v_f)^2 - \mu(m)(v_f - \hat{e}_i)^2 & \text{if } i \text{ adheres to } v_f \end{cases} \quad (4)$$

where m denotes the total number of followers who are expected to adhere, with $m \leq n$.

When follower i adheres to the motivational message, his intrinsic motivation rises from the initial level \hat{e}_i to the level associated with the message, v_f . This corresponds to the idea that transformational leadership allows to increase the intrinsic motivation of followers by making their work more meaningful. Adherence comes at a psychological cost $\mu(m)(v_f - \hat{e}_i)^2$. To interpret this cost, consider first the case of a given value of m . The adherence cost is larger when the message v_f is more distant from the initial intrinsic motivation \hat{e}_i : It is more difficult for a follower to endorse a leader's vision that is not congruent with his initial work values. The value of $\mu(m)$ reflects how follower i is sensitive to the distance between the message and his initial intrinsic motivation: a smaller $\mu(m)$ means a smaller sensitivity to distance. We assume

that the sensitivity is the same for all followers. The value of $\mu(m)$ can be interpreted in several ways: It reflects the persuasiveness of the leader: a more charismatic leader is associated with a smaller $\mu(m)$. It also depends upon followers' acceptance of hierarchy and instructions: When acceptance is high, $\mu(m)$ is lower and followers are more prone to adhere to the leader's vision. Finally it reflects the intensity of social incentives to adhere. Social incentives are defined as the benefits or the costs of participating (or not) to some activity that arise from relationships with other people of a group as the pleasure of doing things together, the emotional gratification of belonging to the group, or conformity effects. In our context, in accordance with the literature on transformational leadership (e.g. Shamir, House and Arthur, 1993; Ashforth and Mael, 1989, or Bass and Avolio, 1994), followers may value joining the new shared experience defined by the leader's vision and derive identity and meaning from being linked to a collective. More prosaically, they may also be subject to conformity or peer pressure effects. Stronger social incentives mean a smaller value of $\mu(m)$.

Consider now that m increases. We will study two cases. The case where $\mu(.)$ is a constant function means that social incentives to adhere to the leader's vision do not increase with the (expected) number of adopters. The case where $\mu(.)$ is a decreasing function means that the intensity of social incentives grows with the team size: each follower is more willing to adhere when he perceives that the message is addressed to a large group of followers, also inclined to accept. As noted before, being part of a larger group of followers who embrace the leader's vision may provide more meaning to each follower, reduce the uncertainty associated with adherence, and/or accentuate the conformity or peer pressure effects.⁸

The leader's (expected) profit is

$$\pi_f = \bar{e}(ny - nb_f) - ns_f - F, \quad (5)$$

where F is the cost of implementing transformational leadership. We assume that this cost is fixed and does not depend upon the number of followers to convince. We will see that even if this assumption is favorable to transformational leadership when the team is large, it is still the case that transformational leadership becomes less and less profitable compared to

⁸One can also think that faced with a larger team, the leader will also articulate a more inclusive vision in order to create a group identity. We will develop this idea more thoroughly in subsection 3.5.

transactional leadership when the number of followers increases, at least when social incentives do not increase too much with the team size. We will discuss later what happens when this assumption of a fixed cost is relaxed.

3 The case of identical followers

In this section, we consider the case where followers are identical: $\hat{e}_i = \hat{e}$ for any i . We make the following assumption.

Assumption 1. (a) $0 < \frac{y}{c} \leq 1$; (b) $0 \leq \hat{e} \leq \min \left\{ \frac{y}{c}, 1 - \frac{y}{4c} - \sqrt{\frac{y^2}{16c^2} + \frac{y}{2c}} \right\}$; (c) For any $n \geq 1$, $\mu(n) \geq \frac{c}{n(2-\hat{e})\frac{c}{y}-1}$.

Conditions (a), (b) and (c) of Assumption 1 guarantee that we will obtain interior solutions and well-defined probabilities. (a) and (b) notably guarantee that $\frac{y}{c} + \hat{e} \leq 1$.⁹ Condition (b) is illustrated in figure 1. We solve the equilibria corresponding to the transactional and transformational styles of leadership.

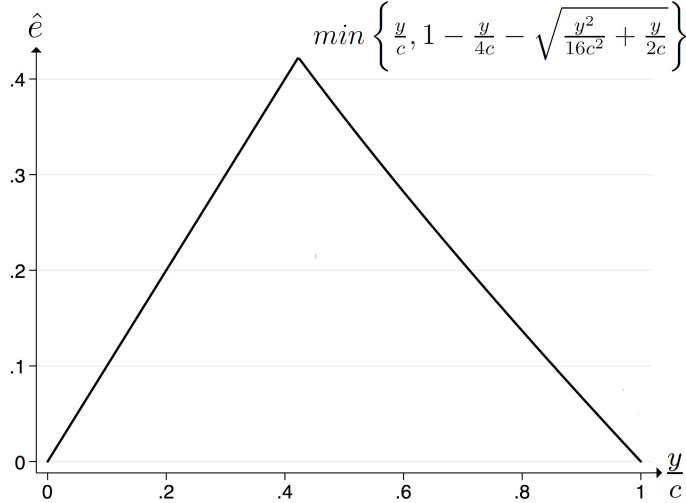


Figure 1

3.1 The transactional leadership equilibrium

We characterize the subgame perfect equilibrium.

⁹Indeed assumption 1 implies that $\frac{y}{c} + \hat{e} \leq \frac{y}{c} + 1 - \frac{y}{4c} - \sqrt{\frac{y^2}{16c^2} + \frac{y}{2c}} = 1 + \frac{3y}{4c} - \sqrt{\frac{y^2}{16c^2} + \frac{y}{2c}}$. However $\frac{y}{c} \leq 1$ guarantees that $\frac{3y}{4c} - \sqrt{\frac{y^2}{16c^2} + \frac{y}{2c}} \leq 0$.

The follower's problem. Consider follower i and the compensation scheme (s_a, b_a) with $s_a + b_a \leq y$. Follower i 's optimal effort level is

$$e_{i,a}^* = \arg \max_{e_i} U_{i,a} = \frac{b_a}{nc} + \hat{e} \quad (6)$$

Expression (6) shows that a higher bonus or a higher initial intrinsic motivation induce follower i to exert more effort. Not surprisingly, the team structure and moral hazard induce free riding: for a given contract (s_a, b_a) , the larger the team, the lower the individual effort. This is due to what Prendergast (1999) calls the “ $1/n$ problem”: When follower i increases effort by de_i units, he gets an extra (expected) benefit of $\frac{de_i}{n} \times b_a$, which is smaller for a larger team. We will refer to this type of free-riding as *transactional free-riding* because it is due to the fact that monetary incentives are less and less efficient as the number of followers increases. Note that follower i exerts the level of effort \hat{e} when $b_a = 0$. At the optimum, the utility level of follower i is $s_a + b_a \hat{e} + (n - \frac{1}{2}) \frac{b_a^2}{n^2 c}$ and the average effort - with its two drivers - reads

$$\bar{e}_a^* = \underbrace{\frac{b_a}{nc}}_{\substack{\text{monetary} \\ \text{incentives}}} + \underbrace{\hat{e}}_{\substack{\text{initial intrinsic} \\ \text{motivation}}} \quad (7)$$

The leader's problem. She maximizes the profit under constraints :

$$\begin{aligned} \max_{b_a \geq 0, s_a \geq 0} \quad & \bar{e}_a^* (ny - nb_a) - ns_a \\ \text{st.} \quad & s_a + b_a \hat{e} + (n - \frac{1}{2}) \frac{b_a^2}{n^2 c} \geq 0 \end{aligned} \quad (8)$$

where \bar{e}_a^* is defined by expression (7). The constraints $b_a \geq 0, s_a \geq 0$ correspond to limited liability. The remaining constraint corresponds to the participation constraint. The base salary does not play any incentive role but represents a cost for the leader who therefore chooses $s_a^* = 0$. The optimal bonus is

$$b_a^* = \begin{cases} \frac{y}{2} - \frac{nc\hat{e}}{2} & \text{if } n \leq \frac{y}{c\hat{e}} \\ 0 & \text{if } n > \frac{y}{c\hat{e}} \end{cases} \quad (9)$$

When $\hat{e} = 0$, the bonus is equal to $\frac{y}{2}$: when the project is successful, each follower gets a bonus equal to one half of the per-capita return of the project.¹⁰ When $\hat{e} > 0$, the leader sets a bonus smaller than $\frac{y}{2}$ because followers are already intrinsically motivated and willing to exert effort. When the team gets larger, the bonus decreases and becomes nil beyond the team size $\frac{y}{c\hat{e}}$. The reason is that as the team size increases, the $1/n$ problem (expression (7)) makes monetary incentives less and less efficient compared to the intrinsic motive to exert effort, whose intensity remains equal to \hat{e} . Dropping the subscript i , the optimal effort level of a follower is

$$e_a^* = \begin{cases} \frac{y}{2nc} + \frac{\hat{e}}{2} & \text{if } n \leq \frac{y}{c\hat{e}} \\ \hat{e} & \text{if } n > \frac{y}{c\hat{e}} \end{cases} \quad (10)$$

Under transactional leadership, at equilibrium, followers exert more effort when their initial intrinsic motivation is higher or when the per capital return of the project under success is larger. As the team size increases, the effort levels decrease and tend to the level associated with the initial intrinsic motivation, \hat{e} .¹¹ The optimal profit reads

$$\pi_a^* = \begin{cases} \frac{1}{4c}(y + nc\hat{e})^2 & \text{if } n \leq \frac{y}{c\hat{e}} \\ n\hat{e}y & \text{if } n > \frac{y}{c\hat{e}} \end{cases} \quad (11)$$

3.2 The transformational leadership equilibrium

We characterize the subgame perfect equilibrium by backward induction. Consider a motivational message $v_f \geq \hat{e}$ and a compensation scheme (s_f, b_f) with $s_f + b_f \leq y$.

The follower's problem. We derive the conditions under which the situation where the n followers accept the compensation contract (s_f, b_f) and adhere to the leader's message v_f is a

¹⁰When $\hat{e} = 0$, $\frac{y}{c\hat{e}} = \infty$ and we always stay in the case $n \leq \frac{y}{c\hat{e}}$.

¹¹Note that assumption 1 guarantees that the effort levels are smaller than one (because $\frac{y}{2nc} + \frac{\hat{e}}{2} \leq \frac{y}{2c} + \frac{\hat{e}}{2} \leq \frac{1}{2} < 1$), which is a necessary condition to define the probability of success.

Nash equilibrium. Consider follower i . His equilibrium effort when he adheres to v_f is

$$e_{i,f}^* = \arg \max_{e_i} U_{i,f} = \frac{b_f}{nc} + v_f. \quad (12)$$

and the associated payoff is

$$s_f + \frac{2n-1}{2n^2c} b_f^2 + b_f v_f - \mu(n)(v_f - \hat{e})^2 \quad (13)$$

If follower i deviates unilaterally from the equilibrium and does not adhere to the vision v_f , the payoff he gets when exerting an effort e_f^d becomes

$$s_f + \left((n-1) \left(\frac{b_f}{nc} + v_f \right) + e_f^d \right) \frac{b_f}{n} - \frac{1}{2} c (e_f^d - \hat{e})^2 \quad (14)$$

Differentiating (14) with respect to e_f^d yields the optimal effort associated with the deviation: $e_f^d = \frac{b_f}{nc} + \hat{e}$. Therefore, the highest payoff reachable by the deviating follower reads

$$s_f + \frac{2n-1}{2n^2c} b_f^2 + \frac{n-1}{n} b_f v_f + \frac{b_f}{n} \hat{e} \quad (15)$$

To have an equilibrium, follower i should not benefit from deviating unilaterally: expression (15) must be smaller than expression (13), which gives $v_f \leq \hat{e} + \frac{b_f}{n\mu(n)}$. Therefore, a follower adheres to the leader's vision if and only if $v_f \in \left[\hat{e}, \hat{e} + \frac{b_f}{n\mu(n)} \right]$.

The leader's problem. For a given b_f , the leader chooses the highest possible message compatible with followers' initial intrinsic motivation:

$$v_f^* = \hat{e} + \frac{1}{n\mu(n)} b_f \quad (16)$$

The expression of v_f^* has several interesting properties. Consider first the case of a given team size, n . The leader has to propose a positive bonus b_f if she wants to make followers accept a message above their initial intrinsic motivation, \hat{e} . In this case, the difference between v_f^* and \hat{e} is higher when the monetary incentives b_f are higher or when the cost of adherence $\mu(n)$ is smaller. This means that there is complementarity between monetary incentives and the

motivational message, a non-monetary incentive.

Second, let us assume that the team grows in size. This has two effects in expression (16) that will interact: a *transformational free-riding effect* corresponding to the term $\frac{1}{n}$, and an *effect on the intensity of social incentives* corresponding to the term $\frac{1}{\mu(n)}$. To make this point clear, consider first the case where $\mu(n) = \mu$, which corresponds to the situation where social incentives to adhere do not increase when the team gets larger. For a given level of monetary incentives, the leader has to propose a less ambitious vision v_f^* if she wants to make followers adhere. This is due to a transformational free-riding effect: if follower i expects that a larger number of followers will accept the message and thereafter exert a higher effort, i is himself less willing to accept the cost of adherence. Consider the case where $\mu(n)$ is decreasing in n . As noted before, this may be due to the fact that social incentives to adhere get stronger when the team size increases. For example, each follower may be more willing to embrace the leader's vision if he anticipates that a large number of other followers will also adhere because adherence offers an immediate sense of transcendence, or more prosaically, because conformity or peer pressure effects are stronger. When n gets larger, the increase in social incentives partly or completely offsets the stronger transformational free-riding effect. Let us define $\varepsilon_\mu(n) = -\frac{n\mu'(n)}{\mu(n)}$ (> 0), a measure of how social incentives to adhere increase with the team size. When $0 < \varepsilon_\mu(n) < 1$, the term $n\mu(n)$ of expression (16) is increasing in n : As the team gets larger, the increase in social incentives is not sufficiently strong to compensate for the stronger transformational free-riding effect and the leader has to choose a vision more congruent with the initial intrinsic motivation of followers. When $\varepsilon_\mu(n) \geq 1$, function $n\mu(n)$ is decreasing in n : social incentives offsets the transformational free-riding effect and the leader can propose a more ambitious vision.

At equilibrium, each follower exerts an effort level equal to $\frac{b_f}{nc} + v_f^* = \frac{\mu(n)+c}{\mu(n)c} \times \frac{b_f}{n} + \hat{e}$. The

average effort - and its three drivers - reads

$$\bar{e}_f^* = \underbrace{\frac{b_f}{nc}}_{\substack{\text{monetary} \\ \text{incentives}}} + \underbrace{\hat{e}}_{\substack{\text{initial intrinsic} \\ \text{motivation}}} + \underbrace{\frac{b_f}{n\mu(n)}}_{\substack{\text{motivational} \\ \text{message (and} \\ \text{social incentives)}}} \quad (17)$$

and the utility level of a follower is $s_f + b_f \hat{e} + (n - \frac{1}{2}) \frac{b_f^2}{n^2 c} + \frac{n-1}{n^2} \frac{b_f^2}{\mu(n)}$. Comparing expressions (7) and (17) shows that the motivational message induces followers to exert effort beyond the transactional level: for a given $b > 0$, $\bar{e}_f^* - \bar{e}_a^* = \frac{b}{n\mu(n)} > 0$. Furthermore, monetary incentives are more efficient under transformational leadership than under transactional leadership: $\frac{\partial \bar{e}_f^*}{\partial b_f} = \frac{1}{nc} + \frac{1}{n\mu(n)} > \frac{\partial \bar{e}_a^*}{\partial b_a} = \frac{1}{nc}$. We sum up these first results in the following proposition.

Proposition 1. Consider a transformational style of leadership. (a) For a given team size, the stronger the monetary incentives b_f , the more followers are willing to accept a leader's vision distant from their initial intrinsic motivation: $\frac{\partial(v_f^* - \hat{e})}{\partial b_f} = \frac{1}{n\mu(n)} > 0$. (b) Suppose the team size increases. This has an impact on social incentives to adhere to the leader's vision. When this impact is limited (in the sense that $\varepsilon_\mu(n) < 1$), the complementary between the monetary incentives and the motivational message is weakened: $\frac{\partial^2(v_f^* - \hat{e})}{\partial b_f \partial n} = \frac{\varepsilon_\mu(n) - 1}{n^2 \mu(n)} < 0$. When the impact is important (in the sense that $\varepsilon_\mu(n) \geq 1$), the complementary between the monetary incentives and the message is reinforced: $\frac{\partial^2(v_f^* - \hat{e})}{\partial b_f \partial n} = \frac{\varepsilon_\mu(n) - 1}{n^2 \mu(n)} \geq 0$.

We can now consider the maximization problem of the leader:

$$\begin{aligned} \max_{b_f \geq 0, s_f \geq 0} \quad & \bar{e}_f^* (ny - nb_f) - ns_f - F \\ \text{st.} \quad & s_f + b_f \hat{e} + (n - \frac{1}{2}) \frac{b_f^2}{n^2 c} + \frac{n-1}{n^2} \frac{b_f^2}{\mu(n)} \geq 0 \end{aligned} \quad (18)$$

where \bar{e}_f^* is defined by expression (17). The optimal bonus is

$$b_f^* = \begin{cases} \frac{y}{2} - \left(\frac{\mu(n)}{\mu(n)+c} \right) \frac{nc\hat{e}}{2} & \text{if } n \leq \frac{\mu(n)+c}{\mu(n)} \times \frac{y}{c\hat{e}} \\ 0 & \text{if } n > \frac{\mu(n)+c}{\mu(n)} \times \frac{y}{c\hat{e}} \end{cases} \quad (19)$$

Comparing expressions (19) and (9) shows that $b_f^* = b_a^*$ when $\hat{e} = 0$ and $b_f^* \geq b_a^*$ when $\hat{e} > 0$. When followers are initially intrinsically motivated, transformational leadership improves the efficiency of monetary incentives relatively to the intrinsic motive to exert effort and therefore the firm chooses a higher bonus than in the transactional case. The optimal message is

$$v_f^* = \begin{cases} \frac{y}{2n\mu(n)} + \left(\frac{2\mu(n)+c}{\mu(n)+c} \right) \frac{\hat{e}}{2} & \text{if } n \leq \frac{\mu(n)+c}{\mu(n)} \times \frac{y}{c\hat{e}} \\ \hat{e} & \text{if } n > \frac{\mu(n)+c}{\mu(n)} \times \frac{y}{c\hat{e}} \end{cases} \quad (20)$$

and the optimal effort level is

$$e_f^* = \begin{cases} \left(\frac{\mu(n)+c}{\mu(n)} \right) \frac{y}{2nc} + \frac{\hat{e}}{2} & \text{if } n \leq \frac{\mu(n)+c}{\mu(n)} \times \frac{y}{c\hat{e}} \\ \hat{e} & \text{if } n > \frac{\mu(n)+c}{\mu(n)} \times \frac{y}{c\hat{e}} \end{cases} \quad (21)$$

Comparing expressions (21) and (10) shows that $e_f^* \geq e_a^*$.¹² Followers exert a higher effort under transformational leadership because they are better paid and have a higher intrinsic motivation because the task is more meaningful. For a given team size n , the lower the cost $\mu(n)$ of adhering to the leader's vision, the larger the difference $e_f^* - e_a^*$. The optimal profit is

$$\pi_f^* = \begin{cases} \frac{1}{4} \frac{\mu(n)+c}{c\mu(n)} \left(y + \frac{c\mu(n)}{\mu(n)+c} n\hat{e} \right)^2 - F & \text{if } n \leq \frac{\mu(n)+c}{\mu(n)} \times \frac{y}{c\hat{e}} \\ n\hat{e}y - F & \text{if } n > \frac{\mu(n)+c}{\mu(n)} \times \frac{y}{c\hat{e}} \end{cases} \quad (22)$$

In the next paragraph we compare the surpluses of followers and the profits under the two styles of leadership.

3.3 Transactional leadership or transformational leadership?

Before studying the leader's optimal choice of leadership style by comparing the profits π_a^* and π_f^* , we can give a first result on consumer welfare.

Proposition 2. When $n < \frac{\mu(n)+c}{\mu(n)} \times \frac{y}{c\hat{e}}$, followers are better off under the transformational style of leadership than under the transactional style. When $n \geq \frac{\mu(n)+c}{\mu(n)} \times \frac{y}{c\hat{e}}$, followers are equally

¹²Note that assumption 1 guarantees that $e_f^* \leq 1$. Indeed $\left(\frac{\mu(n)+c}{\mu(n)} \right) \frac{y}{2nc} + \frac{\hat{e}}{2} \leq 1$ is equivalent to $\mu(n) \geq \frac{c}{n(2-\hat{e})\frac{c}{y}-1}$.

off.

Proof. Under transactional leadership, the equilibrium utility of each follower is equal to $b_a^* \hat{e} + (n - \frac{1}{2}) \frac{b_a^{*2}}{n^2 c}$. Under transformational leadership, the equilibrium utility of each follower is equal to $b_f^* \hat{e} + (n - \frac{1}{2}) \frac{b_f^{*2}}{n^2 c} + \frac{n-1}{n^2} \frac{b_f^{*2}}{\mu(n)}$. When $n < \frac{\mu(n)+c}{\mu(n)} \times \frac{y}{c\hat{e}}$, expressions (9) and (19) show that $b_f^* > b_a^* \geq 0$ and therefore $b_f^* \hat{e} + (n - \frac{1}{2}) \frac{b_f^{*2}}{n^2 c} + \frac{n-1}{n^2} \frac{b_f^{*2}}{\mu(n)} > b_a^* \hat{e} + (n - \frac{1}{2}) \frac{b_a^{*2}}{n^2 c}$. When $n \geq \frac{\mu(n)+c}{\mu(n)} \times \frac{y}{c\hat{e}}$, we have $b_f^* = b_a^* = 0$, followers obtain a nil utility under both styles of leadership. ■

The result in proposition 2 comes from the fact that the bonus under transformational leadership is higher than under transactional leadership: $b_f^* \geq b_a^*$. Furthermore under transformational leadership, followers can accept the contract with the higher bonus b_f^* and still escape from the cost of adherence $\mu(n)(v_f^* - \hat{e})^2$ by deviating and choosing not to endorse the leader's message.¹³ The higher bonus and the possibility to deviate guarantee followers a higher surplus than under transactional leadership.

We now determine whether the leader chooses a transactional style or a transformational style of leadership. Let $\tilde{F}(n)$ denote the particular value of F that makes the leader equally off between transactional leadership and transformational leadership: $\pi_a^* = \pi_f^*$. The higher the value of $\tilde{F}(n)$, the larger the range of F under which transformational leadership is chosen by the leader. We find

$$\tilde{F}(n) = \begin{cases} \frac{y^2}{4\mu(n)} - \frac{n^2 c^2 \hat{e}^2}{4(\mu(n)+c)} & \text{if } n < \frac{y}{c\hat{e}} \\ \frac{1}{4} \frac{\mu(n)+c}{c\mu(n)} \left(y - \frac{c\mu(n)}{\mu(n)+c} n \hat{e} \right)^2 & \text{if } \frac{y}{c\hat{e}} \leq n \leq \frac{\mu(n)+c}{\mu(n)} \times \frac{y}{c\hat{e}} \\ 0 & \text{if } n > \frac{\mu(n)+c}{\mu(n)} \times \frac{y}{c\hat{e}} \end{cases} \quad (23)$$

Proposition 3. Consider a team of size n . If $F < \tilde{F}(n)$, the leader implements a transformational style of leadership. If $F \geq \tilde{F}(n)$ the leader implements a transactional style of leadership. For $n \leq \frac{\mu(n)+c}{\mu(n)} \times \frac{y}{c\hat{e}}$, $\tilde{F}(n)$ is increasing in the output per capita, y ; decreasing in the initial level of intrinsic motivation, \hat{e} ; and decreasing in the sensitivity to distance, $\mu(n)$.

Therefore, for a given team size n , transformational leadership becomes less attractive for

¹³Of course, followers do not deviate at equilibrium, but the possibility to deviate constitutes a sort of outside option for them.

the leader when the cost to endorse the leader’s vision is higher. We have noted that the value of $\mu(n)$ notably reflects the strength of the ties that followers have to others within the team. It could explain the stylized fact that transformational leadership is more effective in contexts higher in “collectivism”. Transformational leadership becomes more attractive when the per-capita output under success, y , is higher. This comes from the fact that a higher y allows a higher bonus, b_f^* , and therefore a higher motivational message, v_f^* , by complementarity between the monetary incentives and the non-monetary incentives. Transformational leadership becomes less attractive for the leader when followers are already initially intrinsically motivated, that is when \hat{e} is larger. This may also explain the development of soft management since the 1980s in response to a “pervasive perception of declining workplace ethics” (Benabou and Tirole, 2016): Providing meaning to employees and managing their “insides” could have been used as a substitute for reduced levels of intrinsic motivation. Casey (1996) notes for example that “the devices of workplace family and team manifest a corporate effort to provide emotional gratifications at work to counter the attractions of rampant individualism”.¹⁴

Suppose now that the team size increases. To study the shape of $\tilde{F}(n)$, it is convenient to make a distinction between the case where the intensity of social incentives to adhere to the leader’s vision is not affected by the team size and the case where the intensity is affected.

No effect of team size on the intensity of social incentives. We have $\mu(n) = \mu$. Consider the case where $\hat{e} = 0$, which means that the worker has no initial intrinsic motivation for work. In this case we have $\tilde{F}(n) = \tilde{F} \equiv \frac{y^2}{4\mu}$ for any $n \geq 1$. We have the paradoxical result that even if the cost to implement transformational leadership is independent of the number of followers, transformational leadership does not become more attractive when the number of followers increases: when $\hat{e} = 0$ and $\mu(n) = \mu$, $\tilde{F}(n)$ is constant in n . The reason is the following. Under constant return to scale (where total production Y is equal to ny), the profit under transactional leadership when followers are not initially intrinsically motivated becomes $\pi_a = \left(\frac{b_a}{c}\right)(y - b_a)$: because of the $1/n$ problem associated with the transactional free-riding problem, a transactional leader working with a team of $n > 1$ followers engenders the same

¹⁴The fact that $\tilde{F}(n)$ is decreasing in \hat{e} may also explain that transformational leadership is notably well suited to situations in which the organization faces uncertainty and change (Bass, 1985 & 1990), as these situations are typically associated with reduced levels of intrinsic motivation among followers.

profit that a transactional leader working with a single follower. What is interesting is that the same result holds for a transformational leader: the profit reads $\pi_f = \left(1 + \frac{c}{\mu}\right) \left(\frac{b_f}{c}\right) (y - b_f)$, and does not depend upon n . As noted before, there are two $1/n$ problems affecting effort under transformational leadership (see expression 17): one on monetary incentives, like for the transactional style, and another one on the motivational message itself, because of the transformational free-riding effect. When $\hat{e} = 0$ and $\mu(n) = \mu$, the two $1/n$ problems explain that a transformational leader with a team of $n > 1$ followers engenders the same profit that a transformational leader with a single follower. $\tilde{F}(n)$ is illustrated in figure 2(a) for $y = 5$, $c = 10$, $\mu = 5$ and $\hat{e} = 0$.

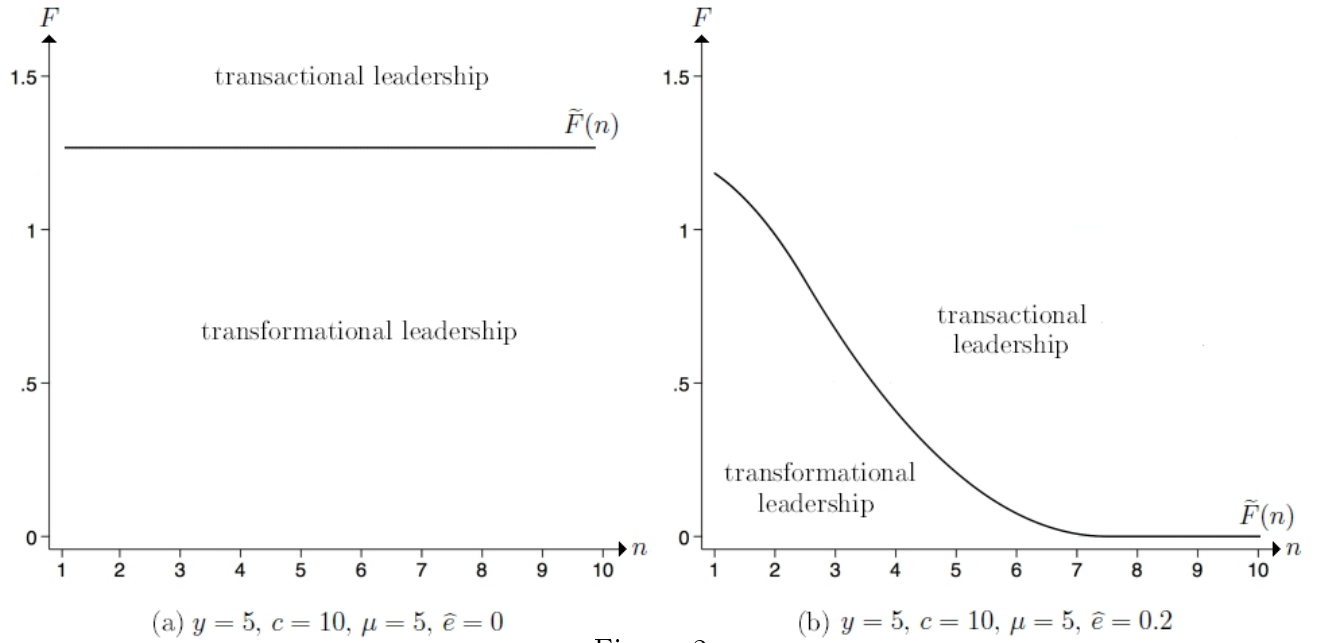


Figure 2

Consider the case where $\hat{e} > 0$. When n increases, $\tilde{F}(n)$ decreases, meaning that transformational leadership becomes less profitable as the number of followers increases, despite the fixed cost of implementing transformational leadership. This is illustrated in figure 2(b) for $y = 5$, $c = 10$, $\mu = 5$ and $\hat{e} = 0.2$. The reason is the following. When the team size increases but the intensity of social incentives stays constant ($\mu(n)$ constant), the transformational free-riding effect forces the leader to propose a less ambitious vision to followers and consequently, the motivational speech and the monetary incentives do not allow to differentiate as much the transformational style from the transactional style: $\tilde{F}(n)$ has to decrease. We show in the

following point that this result does not hold anymore when the team size affects the intensity of social incentives.

Positive effect of team size on the intensity of social incentives. Let us now assume that $\mu(n)$ is decreasing in n . When $\hat{e} = 0$, $\tilde{F}(n) = \frac{y^2}{4\mu(n)}$ becomes increasing in n . A larger team means higher social incentives and a lower psychological cost for followers of endorsing the leader's vision. This makes transformational leadership increasingly profitable for the leader. The case is illustrated in figure 3(a) for $y = 5$, $c = 10$, $\mu(n) = \frac{5}{2}(1 + \frac{1}{n})$ and $\hat{e} = 0$ and in figure 4(a) for $y = 5$, $c = 10$, $\mu(n) = \frac{5}{n}$ and $\hat{e} = 0$.

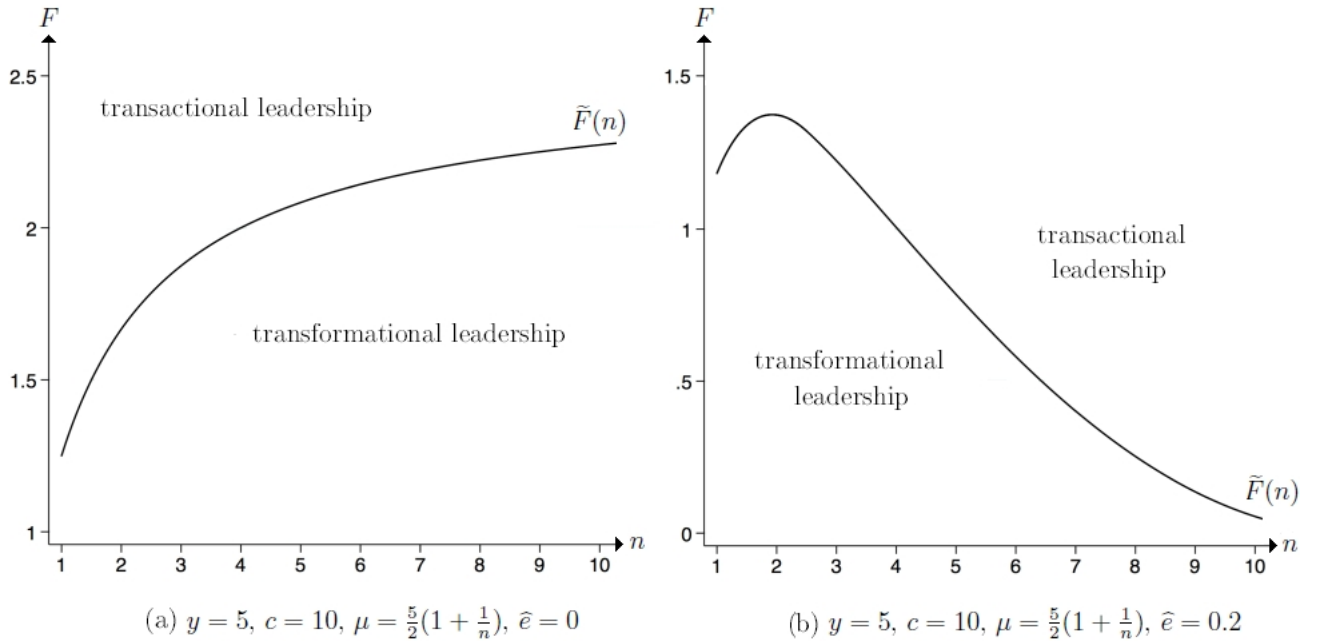


Figure 3.

When $\hat{e} > 0$, there are several possible shapes of $\tilde{F}(n)$ when n increases. The reason is that under transformational leadership, the stronger social incentives to adhere to the leader's vision come to thwart the transformational free-riding effect. When social incentives increase only slightly with the team size, $\tilde{F}(n)$ decreases in n as in the previous paragraph. When social incentives increase moderately with the team size and then reach a ceiling, $\tilde{F}(n)$ first increases with n but then decreases. The case is illustrated in figure 3(b) for $y = 5$, $c = 10$,

$\mu(n) = \frac{5}{2}(1 + \frac{1}{n})$ and $\hat{e} = 0.2$.¹⁵ When social incentives increase and do not reach a ceiling, $\tilde{F}(n)$ increases with n . The case is illustrated in figure 4(b) for $y = 5$, $c = 10$, $\mu = \frac{5}{n}$ and $\hat{e} = 0.2$.

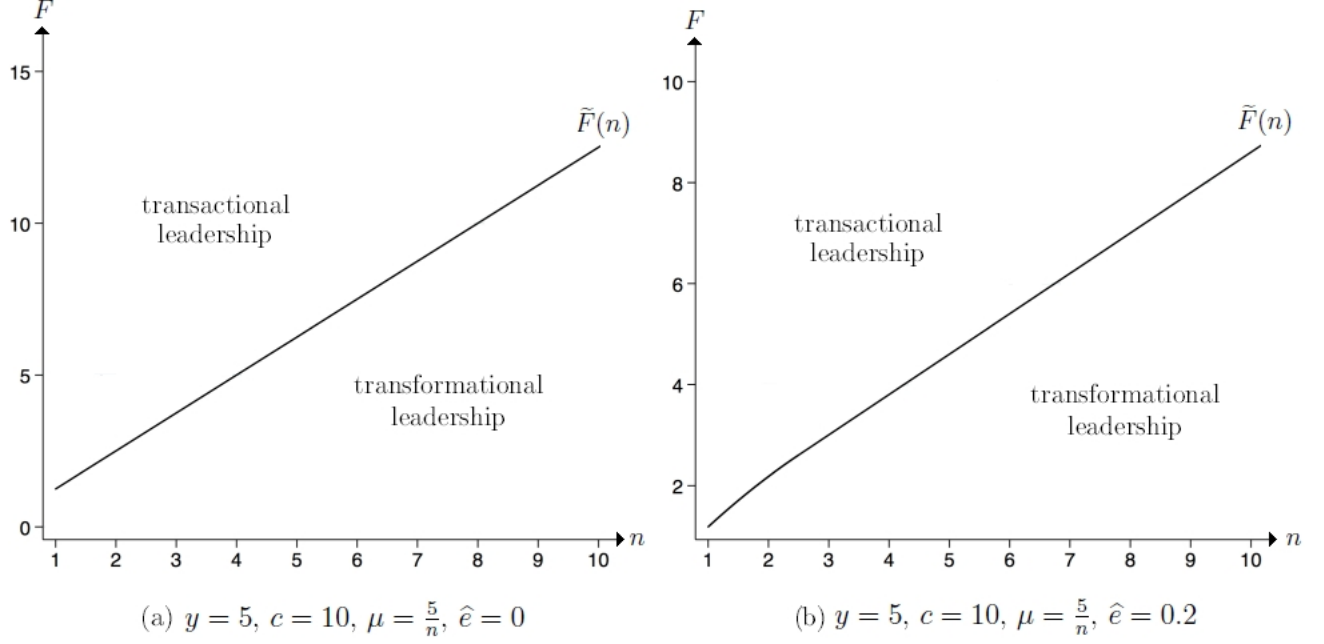


Figure 4

We now study in more details the case where social incentives strongly increase with the team size.

3.4 Can transformational leadership solve the transactional free-riding problem and the moral hazard problem?

Transformational leader and free riding. The transactional free-riding effect can be seen in the expression of the optimal effort under transactional leadership, $e_a^* = \frac{b_a}{nc} + \hat{e}$. We have $\frac{de_a^*}{db} = \frac{1}{nc}$: the efficiency of monetary incentives diminishes as the team size grows. Does transformational leadership allow to restore the efficiency of monetary incentives and remedy to the transactional “ $1/n$ problem” by inducing the effort level $e_f^* = \frac{b_f}{c} + \hat{e}$? The answer is yes provided that social incentives grow sufficiently with the team size. Under transformational leadership, effort is $e_f^* = \frac{b_f}{nc} + v_f$ and the maximum message compatible with followers’ initial

¹⁵Note that $\mu(n) \rightarrow \frac{5}{2}$ when $n \rightarrow \infty$, which can be interpreted by saying that social incentives do not go beyond a certain level.

intrinsic motivation is $v_f = \hat{e} + \frac{b_f}{n\mu(n)}$. Consider the case where the value of $\mu(n)$ is equal to $\frac{c}{n-1}$. In this case, the optimal effort under transformational leadership becomes equal to $e_f^* = \frac{b_f}{c} + \hat{e}$: followers react to monetary incentives irrespective to their number, as if there were only one follower: the transactional and the transformational $1/n$ problems disappear.¹⁶ The optimal monetary incentives become $b_f^* = \frac{y - c\hat{e}}{2}$ and the profit reads

$$\pi_f^* = \frac{n}{4c}(y + c\hat{e})^2 - F$$

We have the following:

Proposition 4. When social incentives grow sufficiently fast with the team size in the sense that $\mu(n) \leq \frac{c}{n-1}$, transformational leadership solves the free-riding problem at a cost equal to F for the leader.

Transformational leadership and the moral hazard problem. While $\mu(n) = \frac{c}{n-1}$ allows to solve the free-riding problem, the moral hazard problem remains and the leader cannot reach the first-best profit associated with the transactional model, considered as a benchmark. To verify this claim, consider the transactional case and suppose that there is no moral hazard: the leader can observe the effort level exerted by each follower. In this case the leader can reach the first-best profit. To do so, she proposes a contract (s_o, e_o) to followers specifying that each follower receives the fixed payment s_o when the effort level e_o is exerted and zero otherwise. The contract (s_o, e_o) yields the reservation utility to each follower: $s_o - \frac{1}{2}c(e_o - \hat{e})^2 = 0$, which implies that $e_o = \sqrt{\frac{2s_o}{c}} + \hat{e}$. The leader maximizes the profit $\left(\sqrt{\frac{2s_o}{c}} + \hat{e}\right)ny - ns_o$ in s_o . The solution is $s_o^* = \frac{y^2}{2c}$, $e_o^* = \frac{y}{c} + \hat{e}$ and the profit reads

$$\pi_o^* = \left(\frac{y}{c} + \hat{e}\right)ny - n\frac{y^2}{2c} = \frac{ny^2}{2c} + \hat{e}ny$$

One can easily verify that $\frac{ny^2}{2c} + \hat{e}ny \geq \frac{n}{4c}(y + c\hat{e})^2$ which means that when $\mu(n) = \frac{c}{n-1}$ the increase in social incentives, while solving the free-riding problem, is not sufficient to solve the

¹⁶For $\mu(n) = \frac{c}{n-1}$, we have $\varepsilon_\mu(n) = \frac{2n}{2n-1} = 1 + \frac{1}{2n-1} > 1$. Social incentives have to solve both the free-riding effect on the motivational message and the free-riding effect on the monetary incentives. Note also that $\mu(n) = \frac{c}{n-1}$ satisfies assumption 1(c) as $\frac{c}{n-1} \geq \frac{c}{n(2-\hat{e})\frac{c}{y}-1}$. Indeed $n-1 < \frac{3}{2}n-1 < n(2-\hat{e})\frac{c}{y}-1$ because $\frac{c}{y} \geq 1$ by assumption 1(a) and \hat{e} is necessarily smaller than $\frac{1}{2}$ by assumption 1(b).

moral hazard problem. We study the shape of $\mu(n)$ that allows to remedy to moral hazard.

A necessary condition to solve moral hazard is $\pi_f^* \geq \pi_o^*$ which can be rewritten as

$$\frac{1}{4} \frac{\mu(n) + c}{c\mu(n)} \left(y + \frac{c\mu(n)}{\mu(n) + c} n\hat{e} \right)^2 \geq \frac{ny^2}{2c} + \hat{e}ny \quad (24)$$

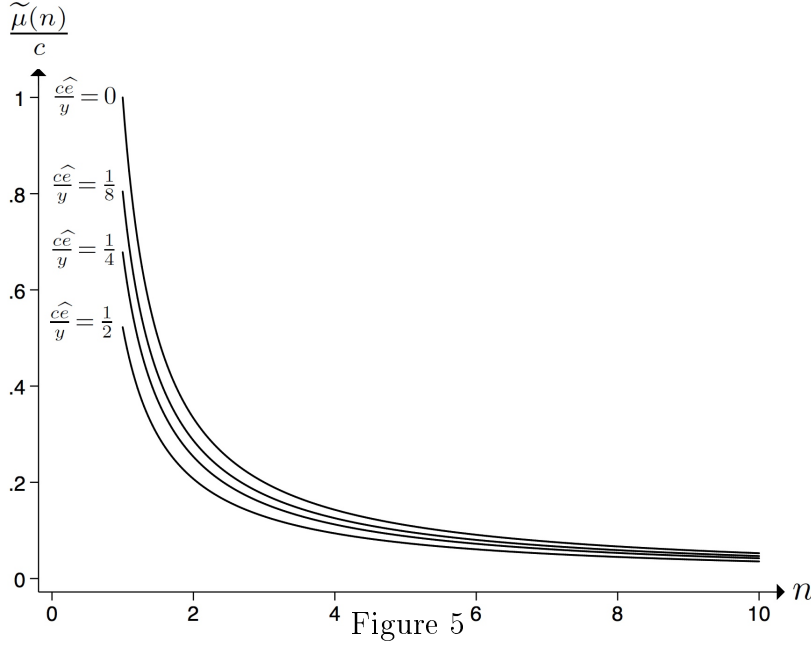
When $\hat{e} = 0$, expression (24) is equivalent to $\mu(n) \leq \frac{c}{2n-1}$.¹⁷ Therefore a necessary condition for the profit under transformational leadership to be at least as large as the first-best profit under transactional leadership is that the sensitivity $\mu(n)$ is bounded above by the decreasing function of n , $\frac{c}{2n-1}$. In fact, transformational leadership remedies moral hazard when $\mu(n) \leq \frac{c}{2n-1}$ and $F \leq \left(\frac{\mu(n)+c}{4\mu(n)} - \frac{n}{2} \right) \frac{y^2}{c}$. Suppose now that $\hat{e} > 0$. Expression (24) can be rewritten as $\frac{\mu(n)}{c} \leq \frac{\tilde{\mu}(n)}{c} \equiv \frac{\left(1 - n - n\frac{c\hat{e}}{y} + n\sqrt{2\frac{c\hat{e}}{y} + 1} \right)}{2n-1+2n\frac{c\hat{e}}{y} - n^2\frac{c^2\hat{e}^2}{y^2}}$.¹⁸ We summarize the results in the following proposition:

Proposition 5. When the conformity effect is sufficiently strong in the sense that $\frac{\mu(n)}{c} \leq \frac{\tilde{\mu}(n)}{c}$, transformational leadership allows to reach the first best associated with the benchmark case and to solve the moral hazard problem at a cost equal to F for the leader.

The threshold $\frac{\tilde{\mu}(n)}{c}$ is represented on figure 5 as a function of n for different values of $\frac{c\hat{e}}{y}$. It is decreasing in n because social incentives have to be stronger as the team size increases. For a given n , it is also decreasing in $\frac{c\hat{e}}{y}$: When followers have a higher initial intrinsic motivation, the advantage of transformational leadership over transactional leadership shrinks. To recover the advantage, it is necessary to have higher social incentives.

¹⁷Assumption 1(c) is satisfied because when $\hat{e} = 0$, we have $2n - 1 \leq n(2 - \hat{e})\frac{c}{y} - 1$ since $\frac{c}{y} \geq 1$.

¹⁸Assumption 1(b) guarantees that $\frac{c\left(1 - n - n\frac{c\hat{e}}{y} + n\sqrt{2\frac{c\hat{e}}{y} + 1}\right)}{2n-1+2n\frac{c\hat{e}}{y} - n^2\frac{c^2\hat{e}^2}{y^2}} \geq \frac{c}{n(2-\hat{e})\frac{c}{y} - 1}$ so that $e_f^* \leq 1$.



3.5 Discussion and extensions

Charismatic leadership. Our framework allows to give a precise definition of the conditions under which transformational leadership becomes charismatic. We have already noted that transformational leaders can increase the intrinsic motivation of followers by different means like (i) making the task(s) more meaningful, (ii) providing more autonomy to followers, (iii) acting as a role model, (iv) being sensitive to followers' needs or (v) creating a group identity.

Charismatic leadership may be seen as a type of transformational leadership that strongly emphasizes point (v): A charismatic leader is usually defined as a transformational leader with a high persuasive power and the ability to shape through a narrative a collective ambition to which the followers can relate. Followers adhere to the leader's vision because participation offers a sense of transcendence, what Durkheim refers to as a "collective effervescence" (Durkheim, 1965). The feeling of belonging to a group is an important source of pride and self-esteem. The charismatic leader articulates a group-oriented vision that serves as a schema of interpretation through which followers can link their self-concept with a broader entity such as a team, a workgroup or the entire organization. He or she acts as an "identity entrepreneur" by "crafting a sense of us" (Haslam et al. 2011). To do so, the charismatic leader highlights the role of followers as key elements of the functioning and the performance of the organization and engages

in the rhetorical use of “we” and “us”.¹⁹ Evidence shows that inclusive messages help people to mobilize. For example, Steffens and Haslam (2013) analyze the Australian federal election speeches of successful and unsuccessful Prime Ministerial candidates of the last 43 elections since 1901 and measure the use of personal (‘I’, ‘me’) and collective pronouns (‘we’, ‘us’) by candidates. They show that victors used more collective pronouns than their unsuccessful opponents in 80% of all elections. On average, victors used collective pronouns every 79 words versus every 136 words for losers.

In our model a natural definition of a charismatic leader is someone who, when the team size gets larger, is able to remedy the transactional free riding problem by nurturing social incentives. In other words the charismatic leader is able to make monetary incentives (at least) equally efficient, regardless of the team size, which corresponds to the case where $\mu(n) \leq \frac{c}{n-1}$. To give an example of a simple function $\mu(n)$ satisfying the previous inequality, consider the case where $\mu(n) = \frac{c}{\theta\gamma(n-1)}$. Parameter $\theta \in \left[0, \sqrt{\frac{3}{2}}\right]$ can be interpreted as the leader’s charisma. Parameter $\gamma \in \left[0, \sqrt{\frac{3}{2}}\right]$ is a “catch-all” parameter that represents employees’ orientation toward the collective, propensity to conform or acceptance of hierarchy.²⁰ When $\theta\gamma \leq 1$, leadership cannot be charismatic and cannot solve the transactional free-riding because the leader’s ability to inspire is too weak or employees’ individualism is too pronounced. When $\theta\gamma \geq 1$, The leader’s charisma is sufficiently developed and followers are sufficiently oriented toward the collective to make leadership charismatic.

Leadership styles, returns to scale and the cost of transformational leadership. Up to now, we have dealt with the case of constant return to scale ($Y(n) = ny$) to establish proposition 1. How is the leader’s choice of leadership style affected when returns to scale are increasing or decreasing? Consider the function $Y(n) = ny(n)$ with $y(1) = y$. Returns are increasing when $y(n)$ is increasing in n , constant when $y(n) = y$, and decreasing when $y(n)$ is decreasing in n . Taking $y(1) = y$ allows to compare the three different regimes of returns to scale because for $n = 1$, the leader will choose the same style of leadership under all regimes. It is easy to show that compared to constant returns to scale, increasing returns will make the

¹⁹The transformational leader often serves as a role model for followers (“leading by example”) because the motivational message is more easily accepted if the leader is perceived as prototypical of the group (van Knippenberg and Hogg, 2003)

²⁰Assumption 1(c) is satisfied because $\theta\gamma(n-1) \leq \frac{3}{2}(n-1) < \frac{3}{2}n - 1 \leq (2 - \hat{e})\frac{c}{y}n - 1$. See footnote 16.

area where transformational leadership is chosen larger. The reason is that $F(n)$ is increasing in y (and therefore also in $y(n)$) as we saw before by studying expression (23). On the contrary decreasing returns to scale will make the area where transformational leadership is chosen smaller. This result suggests that environments with increasing returns are more favorable for transformational leadership: The existence of productive complementarities between team members, by increasing the production per capita with the team size, makes the motivational message more profitable.

It is also interesting to study what happens for a different cost of implementing transformational leadership. So far we have dealt with the case of a fixed cost, F . A natural generalization is to consider a cost of the shape $F + dn$ with $d > 0$. In this case $\tilde{F}(n)$ becomes a decreasing function of n when social incentives to adhere do not increase with the team size. It is for example the case for the values we have considered in figure 2(a): $y = 5$, $c = 10$, $\mu = 5$ and $\hat{e} = 0$. When social incentives are sufficiently increasing in n and d is not too large, $\tilde{F}(n)$ is increasing. Here social incentives have to compensate for the two free-riding effects as in section 3.4 and also for the variable cost of implementing transformational leadership.

Individual-oriented or group-oriented transformational leadership. So far, we have assumed that the leader chooses one dimension of the vision she proposes to followers, namely its “intensity”, ν , expressed in units of effort. In other words, the model is agnostic about the precise instrument used by the leader to implement transformational leadership. However, we have noted in section 3 that faced with a larger team, the leader will also articulate a more inclusive message in order to create a group identity: there is a shift from an individual-focused vision to a group-focused vision. A recent literature makes a distinction between individual- and group-focused transformational leaderships (e.g. Wang and Howell, 2010). Individual-focused transformational leadership corresponds to the situation where leaders display individualized consideration and socio-emotional support to each follower. They provide followers with discretion to act independently and challenge the status quo. The motivational message highlights the development of the individual. Group-focused transformational leadership corresponds to the situation where leaders communicate a shared vision, highlighting the common values and goals of the group, and its uniqueness. This reinforces the group identity of followers, that is,

their sense of belonging to a particular group. Leaders can also act as role model, a prototypical example of the desired behavior. The motivational message highlights the development of the group.

To modelize the individual or group “orientation” of the leader’s vision, we assume that under transformational leadership, the leader now chooses a vision composed of two dimensions, (ν, α) : when $\alpha = 1$, the vision is completely individual focused; when $\alpha = 0$, the vision is completely group focused; cases where $\alpha \in (0, 1)$ describe intermediary situations. The choice of α alters $\mu(n)$, the function that measures followers’ sensitivity to the distance between the message intensity, ν , and the initial intrinsic motivation, \hat{e} . A natural shape of $\mu(n)$ is $\mu(n) = \alpha\mu^i + (1 - \alpha)\mu^g(n)$ where μ^i is a positive constant reflecting followers’ sensitivity to distance when the leader chooses an individual-focused vision and $\mu^g(n)$ is a function reflecting followers’ sensitivity to distance when the leader chooses a group-focused vision. We assume that $\mu^g(n)$ is decreasing in n to reflect the fact that a larger team may induce stronger conformity effects and also foster the development of a group identity.²¹ Furthermore we assume that (i) $\mu^i < \mu^g(1)$ and (ii) there exists a $\tilde{n} > 1$ (possibly real) such that $\mu^i = \mu^g(\tilde{n})$. Point (i) means that faced with a single follower, it is more efficient for the leader to implement an individual-focused vision. However point (ii) means that above \tilde{n} followers, a group-focused vision becomes preferable. Consider first the case where the cost of implementing transformational leadership is equal to F . Maximizing the leader’s program in α gives

$$\alpha^*(n) = \begin{cases} 1 & \text{if } n \leq \tilde{n} \\ 0 & \text{if } n > \tilde{n} \end{cases} \quad (25)$$

The leader chooses an individual-focused transformational leadership in small teams and a group-focused transformational leadership in larger teams. Consider then the following more general cost function of implementing transformational leadership: $\alpha D(n) + (1 - \alpha)F$ where (i) $D(n)$ is increasing in n , (ii) $D(1) < F$, and (iii) there exists a $\hat{n} > 1$ possibly real such that $D(\hat{n}) - F = 0$. Here, the cost of implementing individual-focused transformational leadership, $D(n)$, has basically a variable nature (and is smaller than F for small teams) while the cost of

²¹ Clearly, μ^i and $\mu^g(n)$ could also depend on the leader’s charisma, θ , and $\mu^g(n)$ could depend on employees’ orientation toward the collective, γ , as in the previous paragraph.

implementing group-focused transformational leadership, F , has a fixed nature (and is smaller than $D(n)$ for large teams). The shape of the cost comes to reinforce the previous effect coming from the shape of $\mu(n)$ and gives an advantage to individual focused leadership for smaller teams and group focused leadership for larger groups. The shape of $\alpha^*(n)$ is therefore similar to expression (25), with possibly the property of being continuous in n .

4 The case of heterogeneous followers

We now consider the case of two followers denoted 1 and 2 with different initial levels of intrinsic motivation. The value of a successful project is $Y = 2y$ for a given $y > 0$. Under transactional leadership, follower i 's utility reads

$$\begin{aligned} u_{i,a} &= \bar{e} \left(b_a + s_a - \frac{1}{2}c(e_i - \hat{e}_i)^2 \right) + (1 - \bar{e}) \left(s_a - \frac{1}{2}c(e_i - \hat{e}_i)^2 \right) \\ &= \bar{e}b_a + s_a - \frac{1}{2}c(e_i - \hat{e}_i)^2 \end{aligned}$$

Assumption 2. We have (a) $\hat{e}_1 = 0$, $\hat{e}_2 = \hat{e} \in (0, \frac{y}{c}]$, $\frac{y}{c} + \hat{e} \leq 1$; (b) $\mu \geq \frac{c}{3}$.

Assumption 2 plays an equivalent role to assumption 1. It is required to obtain interior solutions. For simplicity, we assume that follower 1's initial intrinsic motivation is nil while follower 2's initial intrinsic motivation is positive and equal to \hat{e} .

Let (s_a, b_a) denote the compensation contract proposed by the leader under transactional leadership. Follower i exerts effort $e_i = \frac{b_a}{2c} + \hat{e}_i$ and the average effort is $\bar{e} = \frac{b_a}{2c} + \frac{\hat{e}}{2}$. The leader maximizes the firm's profit $\bar{e}(2y - 2b_a) - 2s_a$. The solution is $b_a^* = \frac{y - c\hat{e}}{2}$ and $s_a^* = 0$ and the profit is $\pi_a^* = \frac{1}{4c}(y + c\hat{e})^2$.

Let (s_f, b_f) denote the contract proposed by the leader under transformational leadership. The leader can now deliver three different types of motivational message: a message aimed at follower 1, a message aimed at follower 2, or a message aimed at both followers at the same time.

Case 1. Specific targeting: Message v_f aimed at follower 2. For the given bonus b_f , follower 1 exerts effort $e_1 = \frac{b_f}{2c}$, follower 2 exerts effort $e_2 = \frac{b_f}{2c} + v_f$ and the average

effort is $\bar{e} = \frac{b_f}{2c} + \frac{v_f}{2}$. The expected utility of follower 2 is $s_f + (\frac{3b_f^2}{8c} + \frac{v_fb_f}{2}) - \mu(v_f - \hat{e})^2$. If follower 2 deviates and does not adhere to the leader's vision v_f , the best he can do is to exert effort $e_2 = \frac{b_f}{2c} + \hat{e}$ and obtain the payoff $s_f + \frac{3b_f^2}{8c} + \frac{\hat{e}b_f}{2}$. Follower 2 accepts the message if $s_f + (\frac{3b_f^2}{8c} + \frac{v_fb_f}{2}) - \mu(v_f - \hat{e})^2 \geq s_f + \frac{3b_f^2}{8c} + \frac{\hat{e}b_f}{2}$ or $v_f \leq \hat{e} + \frac{b_f}{2\mu}$. The highest message accepted by follower 2 is $v_f^* = \hat{e} + \frac{b_f}{2\mu}$. Note that follower 1 is too far away from v_f^* to adhere. The effort exerted by follower 1 is $e_1 = \frac{b_f}{2c}$ and the effort exerted by follower 2 is $e_2 = \frac{b_f}{2c} + \hat{e} + \frac{b_f}{2\mu}$. The average effort is therefore $\bar{e} = \frac{b_f}{2c} + \frac{\hat{e}}{2} + \frac{b_f}{4\mu}$. The leader maximizes profit $\bar{e}(2y - 2b_f) - 2s_f - F$. The optimal solution is $s_f^* = 0$ and $b_f^* = \frac{y}{2} - \frac{\mu c}{2\mu + c}\hat{e}$.²² The associated profit is $\pi_f^* = \frac{2\mu + c}{8\mu c}(y + \frac{2\mu c}{2\mu + c}\hat{e})^2 - F$.

Case 2. Specific targeting: Message v_f aimed at follower 1. We must necessarily have $v_f \leq \hat{e}$, because otherwise follower 2 would also endorse the message. We show in the appendix that the highest message accepted by follower 1 is $v_f = \min(\hat{e}, \frac{b_f}{2\mu})$ and the average effort is $\bar{e} = \frac{b_f}{2c} + \frac{\hat{e}}{2} + \frac{1}{2}\min(\hat{e}, \frac{b_f}{2\mu})$. We retrieve a situation that is close to the one where the message was aimed at follower 2, but with a smaller average effort because of the extra constraint $v_f \leq \hat{e}$. From the leader's perspective, this situation is therefore dominated by the specific targeting strategy associated with case 1.

Case 3. Broad targeting: Message v_f aimed at followers 1 and 2. For the given bonus b_f , we have $e_1 = e_2 = \frac{b_f}{2c} + v_f$ which is also the average effort. The expected utility of follower 1 is $s_f + (\frac{3b_f^2}{8c} + b_f v_f) - \mu v_f^2$ and the expected utility of follower 2 is $s_f + (\frac{3b_f^2}{8c} + b_f v_f) - \mu(v_f - \hat{e})^2$. If follower 1 deviates and does not adhere to the leader's vision v_f , the best he can do is to exert effort $e_1 = \frac{b_f}{2c}$ and obtain the payoff $s_f + \frac{3b_f^2}{8c} + \frac{b_f v_f}{2}$.²³ A necessary condition for not deviating is $v_f \leq \frac{b_f}{2\mu}$. Applying the same reasoning for follower 2 gives the condition $\hat{e} \leq v_f \leq \hat{e} + \frac{b_f}{2\mu}$. The two previous inequalities are compatible when $b_f \geq 2\mu\hat{e}$ and the highest compatible message is $v_f = \frac{b_f}{2\mu}$. In this case the effort exerted by both followers is $\frac{b_f}{2c} + \frac{b_f}{2\mu}$, which is also the average effort, \bar{e} . The leader maximizes $\bar{e}(2y - 2b_f) - 2s_f - F$. For the moment we ignore the constraint $b_f \geq 2\mu\hat{e}$ and will verify that the solution we obtain is indeed the right one. The (unconstrained) solution is $s_f^* = 0$ and $b_f^* = \frac{y}{2}$. The associated profit is $\pi_f^* = \frac{\mu + c}{\mu c}\frac{y^2}{4} - F$. Satisfying the condition $b_f \geq 2\mu\hat{e}$ requires that $\frac{\hat{e}}{y} \leq \frac{1}{4\mu}$.

²²Assumption 2 guarantees that $b_f^* \geq 0$, $e_1^* \leq 1$, $e_2^* \leq 1$, and $\bar{e}^* \leq 1$

²³The average effort is $\frac{b_f}{2c} + \frac{v_f}{2}$.

Let us now compare cases 1 and 3. The leader is better off by targeting both followers when $\frac{\mu+c}{\mu c} \frac{y^2}{4} \geq \frac{2\mu+c}{8\mu c} (y + \frac{2\mu c}{2\mu+c} \hat{e})^2$ which is equivalent to $\frac{c\hat{e}}{y} \leq \frac{2\mu+c}{2\mu} \left(\sqrt{\frac{2\mu+2c}{2\mu+c}} - 1 \right) = \frac{2\frac{\mu}{c}+1}{2\frac{\mu}{c}} \left(\sqrt{\frac{2\frac{\mu}{c}+2}{2\frac{\mu}{c}+1}} - 1 \right)$. She targets follower 2 when $\frac{c\hat{e}}{y} > \frac{2\mu+c}{2\mu} \left(\sqrt{\frac{2\mu+2c}{2\mu+c}} - 1 \right)$. One can verify that for any $\mu > 0$ and $c > 0$ we have $\frac{2\mu+c}{2\mu c} \left(\sqrt{\frac{2\mu+2c}{2\mu+c}} - 1 \right) < \frac{1}{4\mu}$,²⁴ which means that focusing on the unconstrained solution in case 3 was the right choice. The areas where each type of targeting is chosen are represented in figure 5.

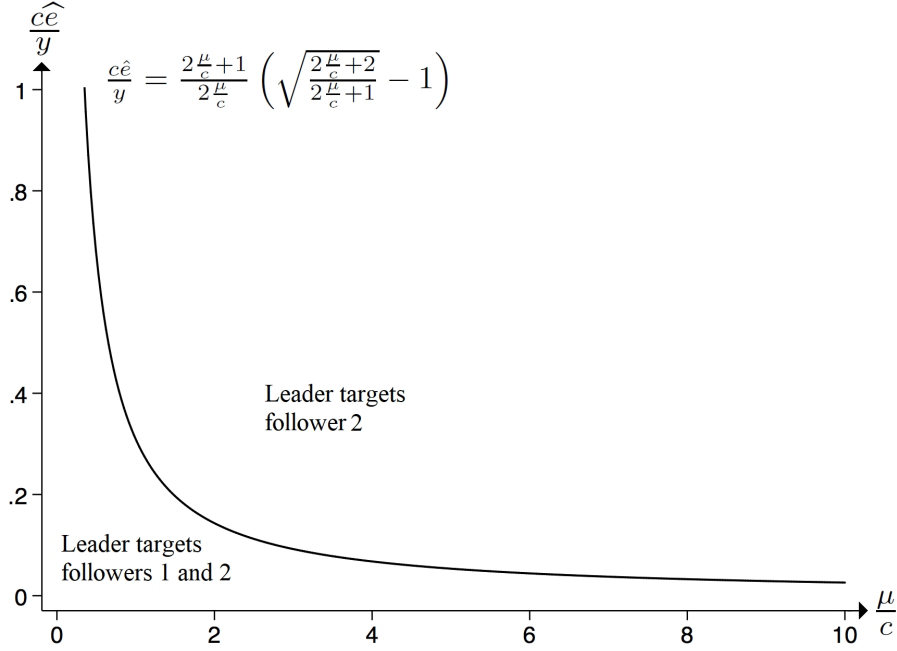


Figure 5

Proposition 6 summarizes the findings.

Proposition 6. Under transformational leadership, the leader's message targets both types of followers when they are not too different (i.e. when $\frac{c\hat{e}}{y}$ is not too large) and when the cost of adhering is not too high (i.e., when $\frac{\mu}{c}$ is not too large). Otherwise the message targets only one type of follower.

In our framework with two different followers, using a motivational message that targets the two types of followers allows to raise the intrinsic motivation of the entire workforce. However

²⁴For any $\mu > 0$ and $c > 0$, inequality $\frac{2\mu+c}{2\mu c} \left(\sqrt{\frac{2\mu+2c}{2\mu+c}} - 1 \right) < \frac{1}{4\mu}$ is equivalent to inequality $\sqrt{1 + \frac{c}{2\mu+c}} < 1 + \frac{1}{2} \frac{c}{2\mu+c}$ which is always true.

the leader has to propose a less ambitious vision because she needs to convince the follower with the smaller intrinsic motivation to adhere. The task becomes even harder for the leader when the two followers are very different (that is, when $\frac{c\hat{e}}{y}$ is high) or when the psychological cost of adhering is high (that is, when $\frac{\mu}{c}$ is high). We now study the leader's choice between the transactional and transformational styles of leadership. Transformational leadership is preferred over transactional leadership when

$$F < \tilde{F} \equiv \begin{cases} (1 - 2\mu\frac{\hat{e}}{y} - \mu\frac{c\hat{e}^2}{y^2})\frac{y^2}{4\mu} & \text{if } \hat{e} \leq \frac{2\mu+c}{2\mu} \left(\sqrt{\frac{2\mu+2c}{2\mu+c}} - 1 \right) \frac{y}{c} \\ \frac{1}{4} \left(\frac{y^2}{2\mu} - \frac{c^2\hat{e}^2}{2\mu+c} \right) & \text{if } \hat{e} > \frac{2\mu+c}{2\mu} \left(\sqrt{\frac{2\mu+2c}{2\mu+c}} - 1 \right) \frac{y}{c} \end{cases}$$

F is larger when \hat{e} is smaller, μ is smaller, or y is larger. We retrieve a result analogous to the one of proposition 3 saying that transformational leadership is more adapted to contexts where the initial intrinsic motivation of employees is not too high, the value of the project is large and the cost of adherence is not too high. The threshold \tilde{F} is illustrated in figure 6 as a function of \hat{e} for $y = 5$, $c = 10$, $\mu = 5$. Note that $\frac{2\mu+c}{2\mu} \left(\sqrt{\frac{2\mu+2c}{2\mu+c}} - 1 \right) \frac{y}{c} \simeq 0.225$.

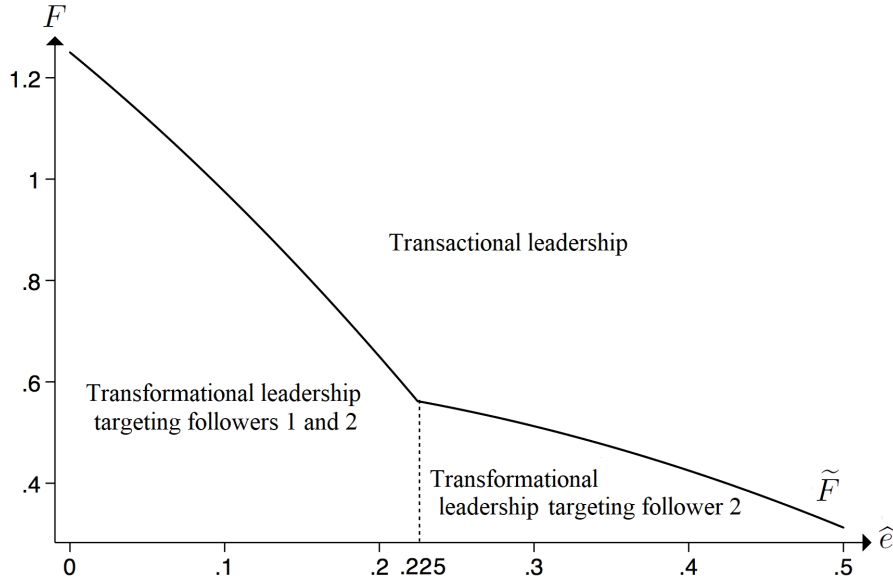


Figure 6

5 Conclusion

In this paper, we have considered a leader who chooses between a transactional or a transformational style of leadership to motivate a team of followers in the presence of moral hazard and free-riding. The transactional style is based on monetary incentives, while the transformational style is based on monetary incentives and two types of non-monetary incentives: a motivational message and social incentives (such as group identity effects or conformity effects). Our framework gives an active role to followers under transformational leadership because they are free to adhere or not to the motivational message, which means that the transformational leader has to choose the appropriate message to convince them. We show that there is a complementarity between monetary incentives and the motivational message: the leader has to set a sufficiently high level of monetary incentives to convince followers to endorse an ambitious vision. Furthermore, transformational leadership is subject to a new type of free riding - the “transformational” free-riding effect - that differs from the traditional “transactional” free-riding effect. In fact, because of moral hazard, each follower is less willing to endorse the leader’s vision and incur the associated psychological cost if he or she knows that the other followers will endorse the vision and exert more effort. There is a tension between the transformational free-riding effect, that hinders endorsement, and the social incentives that foster endorsement. When the team gets larger, the social incentives - if they grow sufficiently strongly - override the two types of free riding and transformational leadership remedies the transactional free-riding and moral hazard problems. Our work therefore highlights the important role played by the social incentives to endorse the leader’s vision and the role of the transformational leader as an “identity entrepreneur”, at least for large teams of followers. In this context, transformational leadership is based on the ability of the leader to craft a “sense of us” through the motivational message (Haslam et al., 2011). As the team gets larger, the leader has to shift from an individual-focus vision to a group-focus vision.

Our results are in line and explain the empirical literature on transformational leadership. First, consistently with empirical evidence, we explain that to be effective, transformational leadership must associate an ambitious vision and high monetary incentives. Second transformational leadership is less effective in environments where the ties that people have to others

within their community are weaker. Third, transformational leadership is less effective in larger organizations, except if the leader is “charismatic” and succeeds in creating a group identity to make followers endorse his or her vision. Fourth, followers are better off under transformational leadership because they benefit from higher monetary incentives and from higher levels of intrinsic motivation, as work is more meaningful.

Appendix

We consider the case of a message v_f aimed at follower 1. It must be the case that $v_f \leq \hat{e}$. For the given bonus b_f , follower 1 exerts effort $e_1 = \frac{b_f}{2c} + v_f$, follower 2 exerts effort $e_2 = \frac{b_f}{2c} + \hat{e}$ and the average effort is $\bar{e} = \frac{b_f}{2c} + \frac{v_f + \hat{e}}{2}$. The expected utility of follower 1 is $s_f + (\frac{3b_f^2}{8c} + \frac{(v_f + \hat{e})b_f}{2}) - \mu v_f^2$. If follower 1 deviates and does not adhere to the leader’s vision v_f , he exerts effort $e_1 = \frac{b_f}{2}$ and obtains the payoff $s_f + \frac{3b_f^2}{8c} + \frac{\hat{e}b_f}{2}$. Follower 1 accepts the message if $s_f + (\frac{3b_f^2}{8c} + \frac{(v_f + \hat{e})b_f}{2}) - \mu v_f^2 \geq s_f + \frac{3b_f^2}{8c} + \frac{\hat{e}b_f}{2}$ or $v_f \leq \frac{b_f}{2\mu}$. The highest message accepted by follower 1 is $v_f = \min\left(\hat{e}, \frac{b_f}{2\mu}\right)$. The effort exerted by follower 1 is $e_1 = \frac{b_f}{2c} + \min\left(\hat{e}, \frac{b_f}{2\mu}\right)$ and the effort exerted by follower 2 is $e_2 = \frac{b_f}{2c} + \hat{e}$. The average effort is therefore $\bar{e} = \frac{b_f}{2c} + \frac{\hat{e}}{2} + \frac{1}{2}\min\left(\hat{e}, \frac{b_f}{2\mu}\right)$. The leader maximizes profit $\bar{e}(2y - 2b_f) - 2s_f - F$ but cannot reach a higher a higher profit than in case 1.

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