Altruistic leadership and job performance: A Darwinian evolutionary perspective

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Abstract: This paper presents an altruistic leadership theory based on evolutionary concepts. The theory proposes that natural processes selected for selfish behaviors, and that these selfish behaviors continue in modern humanity. However, while these selfish tendencies provided positive survival traits among ancestral populations, they induce negative behavioral traits in modern times in most organizational situations. We argue that altruistic behavior – placing followers' needs before one's own – elicits increases in follower performance by increasing their commitment and job satisfaction. However, it seems that the same forces that led to the spread of selfish leadership traits among ancestral humans also inhibit the spread of altruistic leadership traits today. As such, we can expect few naturally altruistic leaders to be available, and we can also expect that organizations must nurture such behaviors to develop trained altruistic leaders. These trained altruistic leaders may have advantages if they can draw upon training to behave altruistically with followers, and selfishly to deal with external competition. We develop these ideas by presenting mechanisms for how selfish leadership traits developed and spread through ancestral humans, what role altruism plays in enhancing follower outcomes, and suggestions for future theoretical development.

Keywords: Altruistic Leadership; Selfish Leadership; Evolutionary Biology; Path Modeling; Population Genetics.

Resumo: *Este artigo apresenta uma teoria de liderança altruísta baseada em conceitos evolutivos. A teoria propõe que os processos naturais selecionam comportamentos egoístas e que esses comportamentos egoístas continuam na humanidade moderna. No entanto, enquanto essas tendências egoístas forneceram traços positivos de sobrevivência entre as populações ancestrais, elas induzem traços comportamentais negativos nos tempos modernos na maioria das situações organizacionais. Argumentamos que o comportamento altruísta – colocar as necessidades dos seguidores antes das próprias – provoca aumentos no desempenho do seguidor, aumentando seu comprometimento e satisfação no trabalho. No entanto, parece que as mesmas forças que levaram à disseminação de traços de liderança egoístas entre os humanos ancestrais também inibem a disseminação de traços de liderança altruísta hoje. Como tal, podemos esperar que poucos líderes naturalmente altruístas estejam disponíveis, e também podemos esperar que as organizações devam nutrir tais comportamentos para desenvolver líderes altruístas treinados. Esses líderes altruístas treinados podem ter vantagens se puderem recorrer ao treinamento para se comportar de forma altruísta com os seguidores e de forma egoísta para lidar com a competição externa. Desenvolvemos essas ideias apresentando mecanismos de como os traços de liderança egoístas se desenvolveram e se espalharam pelos humanos ancestrais, qual o papel do altruísmo na melhoria dos resultados dos seguidores e sugestões para o desenvolvimento teórico futuro.*

Palavras-Chave: *Liderança Altruísta; Liderança Egoísta; Biologia Evolucionária; Modelagem de Caminhos; Genética de Populações.*

1. Introduction

Leadership styles and their impact on organizations have been extensively studied in the past [1, 12, 14, 51]. Relatively little attention has been devoted to understanding why selfish leaders exist, where selfish leaders are those that place their own interests above the welfare of their followers. It seems as if such leaders should not exist for very long. Followers should see that placing their trust in such a leader will harm their own interests. Perhaps organizations, as well as broader groups such as countries, should view such leaders as threats that have to be monitored at all times in order to make sure they advance organizational outcomes rather than their own.

It would seem, therefore, that followers would never accept such a leader long term and organizations would not tolerate such a leader once identified. Instead, the preferred leader would seem to be altruistic – one that places the welfare of followers and the organization before their own. Examples of selfish leaders are Genghis Khan and Al Capone, and of altruistic leaders are Mother Theresa and the Dalai Lama. Reality, however, shows us that selfish leaders exist and thrive beyond the time necessary to recognize and remove such seemingly counterproductive leaders. Indeed, such business stories as those that emerged in the financial crisis (or more recently with Equifax and Wells Fargo) shows us that selfish leaders may continue until the institutions that support them crumble.

The question of why selfish leaders exist may seem to be as unanswerable as why evil exists. We believe, in line with Lawrence & Pirson [27], that taking an evolutionary perspective provides insights into the roles of selfish and altruistic leaders (see, also: [39]). We will develop our argument throughout this manuscript by first providing a background on how evolution can favor costly trait selection, showing that selfish leadership may have evolved as a costly trait – negatively affecting one's survival, while increasing one's reproductive success. We then proceed with a discussion of the role of warfare in selfish leadership evolution, the development of theoretical propositions related to our model. We conclude with a discussion of implications of our model, and suggestions for future research.

1.1 The theoretical orientation adopted here

The theoretical work presented here builds on a combination of methods and techniques related to path modeling and the Monte Carlo method, together with population genetic principles [22-24]. We hope that this orientation helps us theorize novel elements and avoid possibly restrictive assumptions building on social evolution mathematics and game theory elements, which have nevertheless been of much value in past research [7]. Instead, we depart from path models (see, e.g., [24-25]), following a theory development tradition that dates back to the foundational work conducted by Wright [57-58]. He was one of the developers of the field of population genetics, and also the inventor of path analysis. As will be seen in the following sections, departing from path models allows us to model fairly complex interactions among variables in ancestral populations.

Also informing the theoretical work presented here is a perspective that sees organizational leaders are motivators of altruistic behavior among their followers [30-32]. This perspective focuses on how organizational leaders can motivate their employees in non-selfish ways with the goal of maximizing job performance. In many respects, this serves as a counterbalance to expectations based on evolutionary theorizing. As it will be seen in the following sections, we posit that biological forces building on genetic mutation and selection led to the evolution of selfish leadership traits among ancestral human populations. Nevertheless, and more in line with the view of organizational leaders are motivators, we also posit that altruistic leadership behavior provides the kind of signals that boost job performance among employees.

## 2. The evolution of costly traits through selection

For any population of individuals under selection pressures, a trait that has a genetic basis will evolve only if there is a positive correlation between the trait and reproductive success (a.k.a., fitness). That is, a trait will increase in frequency across generations in a population only if the individuals who possess the genes associated with the trait leave more surviving offspring than individuals without those genes [24, 41-42]. This applies to both costly and non-costly traits, which we discuss below. In this context, a population could be seen as a group of individuals belonging to family units who live together in the same environment [3, 16].

Costly traits evolve via selection even though they are often detrimental to survival, which is what makes them "costly" to the individuals who display them [24, 59-60]. The classic example of costly trait evolution is the male peacock's train; often incorrectly referred to as the male peacock's tail (both male and female peacocks have tails; only males have trains). Males of the peacock species have evolved elaborate, large, and colorful trains via selection. This has occurred at the expense of the male peacocks' own survival, as the trains impair mobility, and make it more difficult for the peacocks to flee predators. The reason for this is that those trains, as cumbersome as they may look to us, make the male peacocks more attractive to the females [24, 59-60].

It is common for costly traits to initially increase in frequency in a population due to survival-enhancement selection. For example, symmetrical but small trains would signal an effective immune system to potential mates [33-34], where the underlying immune system trait would tend to increase the survival success of their bearers. However, these traits frequently tend to become exaggerated due to the concomitant evolution of the traits themselves and the preference for those traits [34, 42], and over time become costly in terms of survival to those individuals that host the genes coding for the trait. The evolution of costly traits is illustrated in a generic way through Figure 1.

Figure 1. Evolution of costly traits
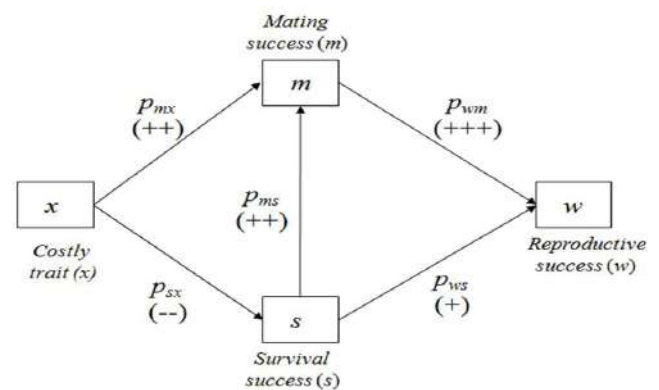
Notes: + = positive association (e.g., an increase in x leads to an increase in m); – = negative association; +, ++, +++ = small, medium and large positive associations (the same for negative association).

Here we have a path model with causal links. Under each path coefficient (e.g., p_{mx}) we have symbols that indicate the sign of the association and its strength. For example, "+++" indicates a positive and strong association. The variables (e.g., x) are measures that apply to a population of individuals; i.e., in a table of with population data, each column would refer to a variable and each row would refer to an individual in the population over a period of time. Given that this is a path model, we assume that all variables are standardized – i.e., scaled to have a mean of zero and standard deviation of one. This is also done for simplicity, and without any impact on the generality of our discussion.

Survival success (s) is measured as the age of an individual at the time of death, and mating success (m) as the number of lifetime copulations in which the individual has engaged. Survival success (s) is shown as a precursor of mating success (m) because an individual normally must be alive to engage in sexual intercourse, even if the individual dies as a result of the intercourse [24]. Normally selection pressure for the evolution of a costly trait will be applied primarily on males, from whom the underlying genes

will spread to both males and females. A major component of that pressure will be in the form of female choice; i.e., via sexual selection [6, 24]. In this model the costly trait measured via x will evolve only if its correlation with reproductive success (w) is positive. Stated differently, the trait (x) will evolve only if its total effect on w is positive. This can be stated mathematically as:

$$p_{mx} p_{wm} - p_{sx} p_{ws} - p_{sx} p_{ms} p_{wm} > 0.$$

In our generic model this would require that

$$p_{mx} p_{wm} > p_{sx} p_{ws} + p_{sx} p_{ms} p_{wm}.$$

If the costly trait (x) makes the males who possess it more attractive to the females in the population, those males may have a disproportional advantage in terms of reproductive success (w), even if their lifespan is on average significantly shorter than that of the males not possessing the costly trait. Mathematically, this would lead to a value for p_{wm} that would be much higher than that for p_{ws}. In this case, the product $p_{mx} p_{wm}$ would tend to be much higher than $p_{sx} p_{ws}$, because the component standardized path coefficients would be fractions (e.g., 0.39). Likewise, the product $p_{mx} p_{wm}$ would also tend to be much higher than $p_{sx} p_{ms} p_{wm}$; this is due to the fact that, even though it contains p_{wm}, the latter is a product of three fractions.

Let us illustrate this through an example with path coefficients that approximate those associated with small, medium and large effect sizes (Cohen, 1988; 1992). These would respectively be $0.02^{0.5} \approx 0.14$, $0.15^{0.5} \approx 0.39$, and $0.35^{0.5} \approx 0.59$. It should be noted here that path coefficients equal to or greater than 1 would be an indication of massive collinearity, either vertical or lateral; where two variables would measure the same underlying trait [26]. Therefore, path coefficients equal to or greater than 1 are not expected to occur in correctly specified and viable models of trait evolution. Replacing the path coefficients in the figure with these values, according to the strengths indicated in the figure (e.g., the symbol "++" means a medium association), we then have

$$p_{mx} p_{wm} > p_{sx} p_{ws} + p_{sx} p_{ms} p_{wm} \rightarrow$$

$$0.39 \cdot 0.39 > 0.39 \cdot 0.14 + 0.39 \cdot 0.39 \cdot 0.59 \rightarrow$$

$$0.1521 > 0.0546 + 0.0897 \rightarrow$$

$$0.1521 > 0.1443.$$

As we can see, in this example the inequality required for the evolution of the costly trait (x) is satisfied. That is, 0.1521 is greater than 0.1443, and thus the difference 0.1521 – 0.1443 is greater than zero. Therefore, the costly trait (x) will tend to spread in the population and become "fixed" [33-34]. The amount of time required for the costly trait (x) to spread to the entire population can be estimated through the equation below [19], where S is the selective advantage conferred by the trait, P is the size of the population, and G is the amount of time required for a new generation to emerge.

$$T = 2/S \ln (2P) \cdot G.$$

The value of S can be estimated to be 0.0537 via a Monte Carlo simulation [46] based on the path model; that is, individuals possessing the costly trait would leave 5.37 percent more surviving offspring than individuals not possessing the trait. Let us assume a population size (P) of 150; and 20 years as the time required for a new generation to emerge (G), likely to be common in our ancestral past [3, 16]. Under these assumptions, the amount of time required for the costly trait to spread to the entire population would be 4,251 years.

As we can see, even a small selective advantage of a little over 5 percent can lead to a trait spreading to an entire population of 150 individuals in a little more than 4,000 years. As long as the right combination of selection pressures and genes exist, which may take millions of years to occur, a costly trait like the one illustrated above can evolve independently in multiple isolated populations of individuals of the same species.

3. A costly trait theory of selfish leadership evolution

The preceding section provided an introductory and generic discussion on the evolution of costly traits by selection, with a model in which the costly trait's relationships with survival success and mating success were not explicitly mediated by intermediate effects. This section uses that discussion as a basis for a more specific theoretical development focused on selfish leadership, with a more detailed model. This model proposes mediating effects between that trait and success in terms of survival and mating.

In our ancestral past, it is very likely that humans living in very small groups (e.g., a single-family unit) would have been much less effective in the performance of tasks critical for survival [50]. In this context, two types of tasks were particularly important: procuring food by hunting [8, 52]; and killing off predators that either competed for food with humans or preyed on humans [3, 52].

However, the advantages of group living could only be achieved through coordinated actions by multiple individuals, which required the evolution via selection of related behavioral traits [8]. Chief among such behavioral traits are those associated with leading groups engaged in collaborative tasks, such as group hunting. Since there can be no leaders without followers, important behavioral traits also included those associated with working well under the leadership of one or a few individuals; i.e., being a good follower.

Leaders in our ancestral past would direct the action of multiple individuals toward violent activities; such as hunting and

killing off predators. Since that violence could also be directed at individuals in the group, evolution would have favored behavioral traits among followers that would reduce the potential for leader-follower conflict, e.g., traits that would indicate the followers' admiration of and subservience to leaders. Viewing leaders as high social status individuals in the group, and treating them as such, would likely increase the survival chances of followers. This would be particularly effective if inspired by genuine feelings, so that followers would not have to rely on easily identifiable deception [5, 54-55]. Within this framework, ancestral females would be much more likely to willingly have intercourse with males that displayed leadership traits.

We propose that leadership traits would have evolved and spread to all individuals in a population, in part because that would take advantage of the flexibility, enabled by the complex human brain, to express traits based on environmental circumstances. This can be contrasted with the less flexible class traits evolved by social insects [56]. As such, even though leaders would be seen by followers as high social status individuals, followers would also have latent leadership traits that would make them see themselves as potential leaders under the right circumstances. Therefore, among the evolved behavioral traits of ancestral leaders would be propensity to accumulate power to maintain the leadership position, promoting a leadership style that we refer to as *selfish* leadership. These competing traits would lead to an inherent conflict between leaders and followers, increasing the chances that leaders would be disliked by followers.

Figure 2 illustrates the interplay of effects discussed above, ultimately leading to the evolution selfish leadership as a costly trait. The positive effects of selfish leadership (f) on social status (o), and of social status (o) on mating success (m), are conservatively estimated to be of medium magnitude. The positive effect of selfish leadership (f) on general dislike (d) elicited on followers is estimated to be of the same magnitude as the positive effect on social status (o). The negative effect of general dislike (d) by followers on the survival success (s) of the leader is estimated to be of small magnitude, because of the leader's ability to counter challenges from followers competing for leadership. Among the mechanisms employed by leaders would be retaliation via other followers, possibly leading to the death of competitors. This would lead to the development of related traits that would prevent followers from inadvertently but overtly acting as usurpers, ultimately leading to evolution of traits such as fear of public speaking [17, 47].

The general dislike elicited on followers by selfish leadership is posited in our theory to have led to decreased satisfaction by followers with group belonging and decreased commitment of followers to the group to which they belonged. This would have led followers to want to join other existing groups or start new groups. The resulting migration would have led to the spreading of selfish leadership traits to groups other than the original groups in which those traits evolved, should those traits not have already evolved in those other groups. The reason for this is that, as we hypothesized above, followers would also have latent selfish leadership traits. Ultimately, such migrations would contribute to the widespread occurrence of selfish leadership traits in ancestral human populations.

As we have done before for our general discussion of the evolution of costly traits, let us illustrate the interplay of effects leading to the evolution of selfish leadership through an example with path coefficients that approximate those associated with small, medium and large effect sizes [10-11]: respectively 0.14, 0.39, and 0.59. This takes us to Figure 3. As long as the expression yielded a value greater than zero, gene-induced selfish leadership is likely to have spread to all individuals in any ancestral population where at least one individual possessed the genes that coded for the expression of the trait.

Figure 2. The evolution of selfish leadership
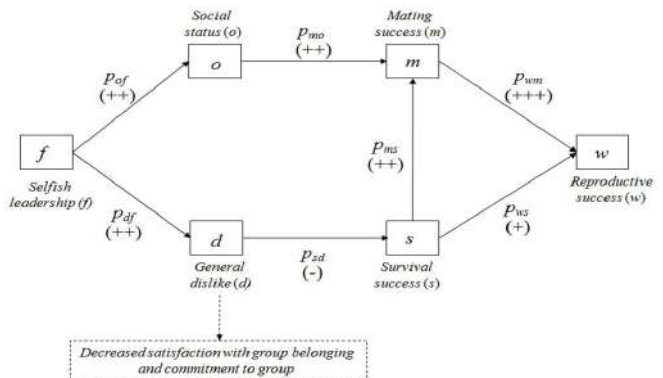
Notes: + = positive association (e.g., an increase in x leads to an increase in m); – = negative association; +, ++, +++ = small, medium and large positive associations (the same for negative association).

Figure 3. The total effect of selfish leadership on reproductive success
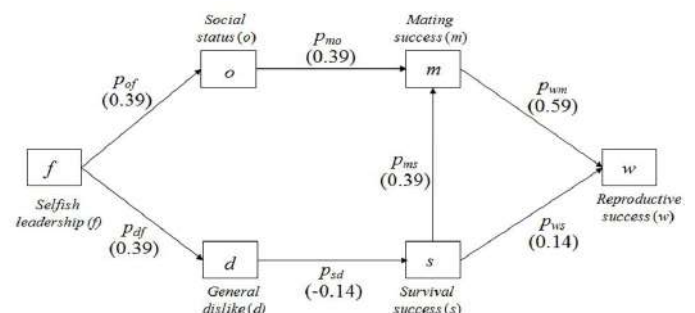
Notes: small, medium and large associations were replaced with the values $0.02^{0.5} \approx 0.14$, $0.15^{0.5} \approx 0.39$, and $0.35^{0.5} \approx 0.59$; Cohen's [10-11] small, medium and large effect sizes were used as a basis.

As we can see below, in this example the inequality required for the evolution of selfish leadership (*f*) is satisfied (i.e., 0.0695 is greater than 0). Therefore, selfish leadership would have spread in any population with the characteristics summarized by the path model. The selective advantage conferred by selfish leadership can be estimated to be 0.0441 via a Monte Carlo simulation [46] based on the path model; that is, individuals possessing the selfish leadership trait would leave 4.41 percent more surviving offspring than individuals not possessing the trait.

$$p_{of} \, p_{mo} \, p_{wm} \text{-} p_{df} \, p_{sd} \, p_{ws} \text{-} p_{df} \, p_{sd} \, p_{ms} \, p_{wm} > 0 \rightarrow$$

$$0.39 \cdot 0.39 \cdot 0.59 \text{-} 0.39 \cdot 0.14 \cdot 0.14 \text{-} 0.39 \cdot 0.14 \cdot 0.39 \cdot 0.59 > 0 \rightarrow$$

$$0.0695 > 0.$$

Like we have done before in our general discussion of the evolution of costly traits, we assume here a population size of 150; and 20 years as the time required for a new generation to emerge. Under these assumptions and using the population genetics equation introduced earlier for estimation of the time needed for fixation of a trait with a genetic basis [19], the amount of time required for selfish leadership to spread to the entire ancestral population would be 5,171 years.

4.   How does our theory relate to human warfare?

Our costly trait theory of selfish leadership evolution assumes an evolutionary context where humans lived in groups that regularly engaged in violent behavior toward other animal species: herbivores, as primary sources of nutrients; and land carnivores, as competitors and potential predators. Human warfare epitomizes violent behavior. Therefore, a relevant question in the context of our evolutionary theorizing is: How does our theory relate to human warfare? Our answer, explained further below is as follows. We believe that the evolution of selfish leadership preceded the emergence of human warfare and may have indirectly contributed to that emergence. We do not believe that human warfare was a major factor in the evolution of selfish leadership traits.

The propensity of humans to engage in warfare can be seen as a species-wide maladaptation associated with prior adaptations enabling human ancestors to successfully accomplish two main survival-enhancing tasks of a violent nature: procuring food by hunting; and killing off predators that either competed for food with humans or preyed on humans. From a species-wide perspective, warfare is a maladaptation because it nearly always leads to a reduction in the number of individuals in the species. Let us assume that only a few groups of humans existed at a given point in time in our ancestral past, and that the groups had similar size and composition in terms of age and sex. In this scenario, sustained group warfare could potentially have left such a small number of surviving humans that environmental threats (e.g., the

emergence of a new infectious disease) could have caused the extinction of the entire species.

From the perspective of a group of ancestral humans, however, warfare may have been adaptive in the sense that it may have increased the reproductive success of the winning group, to the detriment of the losing group. But since the winning group would likely absorb the loser [3, 9], the impact on the spread of selfish leadership would be inconsequential. Let us assume the unlikely scenario that altruistic leadership had evolved in one of two warring groups, instead of selfish leadership. The two traits would then be present in the group resulting from the merger. Based on our foregoing discussion, it is our belief that selfish leadership would have spread. This would be the case even if the winning group was the altruistic leadership one, as long as a fraction of the other group survived. And this would occur relatively fast in evolutionary terms, namely in a few thousand years.

Behavioral traits associated with selfish leadership have not, in our view, evolved primarily as a result of warfare. They have evolved in response to needs that likely preceded the advent of warfare, but that nevertheless also involved violence toward other animal species. Those needs were motivated by the development of a brain that roughly doubled in size from the emergence of the primarily herbivore *Australopithecus afarensis* to the appearance of the omnivore *Homo sapiens*; the latter's brain consuming approximately 20 percent of an individual's daily energy needs. Driven by that increase in brain size were changes in the human digestive tract, which is unique among primates in its adaptations for the consumption of meat [38, 52].

These changes have supported an omnivorous diet that included a variety of animals, causing conflict with competing carnivores, well before the advent of farming in the Neolithic [43]. However, the advent of farming has not reduced the human propensity to engage in warfare. If anything, it appears to have increased it. Farming enabled the formation of increasingly larger groups, supported by the cultivation of grain-based plant foods with high caloric content. Up until the very recent emergence of weapons of mass destruction, the size of a fighting group had invariable been a key factor in whether that group was victorious in war [49]. Thus, farming created a propitious environment for the emergence of those who Machiavelli referred to as "princes" [13]; an environment in which selfish leaders could expand their power and influence via warfare waged with increasingly large armies. The main inspiration for Machiavelli's "princes" were rulers of influential cities in Europe in the 1500s, such as Lorenzo di Piero de' Medici, ruler of Florence from 1516 until his death in 1519. These rulers often exercised their power in the face of moral corruption [13] and were willing to act unscrupulously and violently as needed.

Human warfare in the Neolithic may have further contributed to the permanence of the selfish leadership trait

in human populations, but it is unlikely that it had anywhere near the same influence as meat-eating. The emergence of powerful competing selfish leaders has influenced the formation of marriage alliances [15, 20], and increasing pressure against large-scale sexual polygamy. Sexual selection significantly loses its strength in populations with predominantly monogamous sexual relationships. Moreover, single-child family heiresses were particularly attractive to powerful selfish leaders, who would then be more likely to inherit their parents' possessions. Since fertility is a highly heritable trait, single-child family heiresses would on average have low fertility. While these patterns (see, e.g., [53]) do not favor the evolution of selfish leadership as theorized by us, they are too recent to have had any negative effect on the evolution of a trait that might have become widespread among *Homo sapiens* as early as 100,000 years ago.

5. Theoretical propositions related to modern organizations

As can be seen from the prior discussion, the selfish leadership trait should have evolved and become ubiquitous across all cultures in the world. As such, we can expect to run into people with this trait in all areas of modern life, and, specifically for this paper, in modern organizations. We can use our understanding of how selfish (and altruistic) leadership traits are likely dispersed throughout human populations to posit some ideas about how these distributions would appear in organizations. First in these explorations, let us turn to natural altruistic leaders.

5.1 Natural altruistic leaders exist but are few

Behavioral traits, like most traits that are regulated by brain functions, are influenced by many genes [35, 37]. Since individual gene mutations appear at random in populations, the distribution of a behavioral trait that has a genetic basis in a population would tend to mimic that of a variable that is the sum of independent and uniformly distributed random variables [18]. Such a trait measurement variable would have a normal distribution [9, 33]. The number of genes influencing a trait does not have to be very high (e.g., thousands) for this to happen. Figure 4 illustrates the distribution of a behavioral trait that is influenced in such a fashion by only 10 genes; i.e., the trait measurement variable is the sum of 10 independent and uniformly distributed random variables.

We use the term *natural* altruistic leaders to refer to individuals that are placed below a threshold that could be used to distinguish altruistic from selfish leaders, without receiving any training or making any conscious effort to act as altruistic leaders. The threshold could be an average score of 4 provided by an organization's employees (i.e., followers) on a 1 to 7 Likert-type scale (1 = strongly disagree, 7 = strongly agree), responding to a question of the type: our organization's leader shows concern about my well-being. We refer to leaders who are natural selfish leaders but who act as altruistic leaders as *trained* altruistic leaders. The terms *natural* and *trained* can be used as qualifiers to altruistic or selfish leaders, in a similar fashion.

The area under the normal curve in the figure is made up of two sub-areas, one to the left and the other to the right, each separated from the other by the vertical bar indicating the selfish leadership threshold. The theoretical position of the threshold can be seen as the mean of the distribution of a truly altruistic natural leadership trait; which, if it existed in a population, would have been supplanted by selfish leadership under ancestral selective pressures. As we can see, the area on the left is relatively small compared to the area on the right, which leads to the *altruistic leaders' rarity proposition* below.

Altruistic leaders' rarity proposition: *In a random sample of organizational leaders, typically there will be significantly fewer natural altruistic than natural selfish leaders.*

Note that, even though we theorize that selfish leadership has evolved to the point of fixation in ancestral human populations, and thus should be widespread among modern leaders, this does not mean that there are no natural altruistic leaders. As explained in this section, this is due to the fact that behavioral traits that have a genetic basis, such as selfish leadership, are virtually always influenced by many genes, whose individual effects normally operate in an additive manner [18, 42]. This leads to a normal distribution where a relatively small proportion of individuals are expected to paradoxically display what could be seen as the opposite of the evolved trait; e.g., altruistic leadership, versus the evolved selfish leadership.

Figure 4. Natural altruistic leaders are few
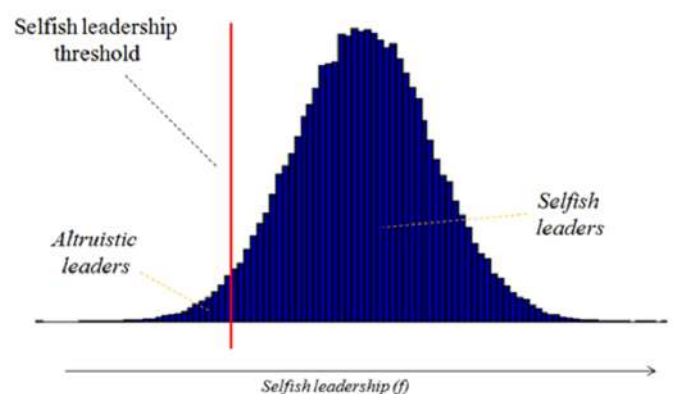
Notes: area under normal curve to the left of vertical bar = proportion of altruistic leaders; are to the right = proportion of selfish leaders.

5.2 More males than females are either altruistic or very selfish leaders

In our costly trait theory of selfish leadership evolution, we focus on the selective pressure placed by females in favor of males displaying selfish leadership traits. While the theoretical path model that we have developed focused on males, we have proposed that selfish leadership traits would spread to both males

and females. This phenomenon is quite common in traits whose functionality is critically important in one sex, but rarely used in the other sex [6, 37]. For example, both men and women have mammary gland tissues, even though those tissues are rarely used for their evolved purpose in males.

Implicit in our theorizing is the causative effect of female choice on selfish leadership. Note that we hypothesize selfish leadership to be a trait that is displayed regardless of biological sex, even though it would have been of more limited use for females in the ancestral context where it evolved. The reason for the limited use in females is the trait's negative impact on survival, combined with the disproportionately greater survival success importance among females than males for any population of ancestral humans. If only a few fertile females are present in such a population, regardless of the number of males, the population may easily disappear in a few generations. Conversely, only a few fertile males are needed to ensure the continued existence of a population with a large number of females.

The causative effect of female choice on the evolution of a trait that is present in both sexes has an interesting effect on the distribution of the trait among males and females, which we discuss in this section in the context of the development of an important theoretical proposition. Whenever a generic variable is caused by another generic variable , it can be expressed as

$$y = \beta_x + \varepsilon$$

In the equation above is an uncorrelated error variable that accounts for the variation in that is not explained by . Behavioral traits are mental traits, which are not physically visible or easy to spot. It is therefore particularly important that mental traits be shared by both sexes when one sex is the primary force behind the selection of the traits via mate choice [35, 37]. The reason is that possessing a mental trait makes it significantly easier for a person to recognize the existence of the trait in another person [8, 55], and thus select individuals with the trait as mates [37].

Therefore, we can replace in the equation above with a measure of selfish leadership in males belonging to a population of humans in our ancestral past. Similarly, we can replace with a measure of selfish leadership in females belonging to the population. At fixation, this will lead to more variability in than in , due to the extra variation coming from . In the context of our discussion, an important side effect of this purely statistical phenomenon emerges: the measure of selfish leadership (*f*) will have greater variance for males than females, which is illustrated in Figure 5.

At the top of the figure, we have the distribution of the selfish leadership measure (*f*) among females. At the bottom we have the distribution among males. Both normal curves at the top and bottom are assumed to have the same total area under them. They are also assumed to have the same mean; that is,

on average, males and females tend to score about the same on measures of selfish leadership. However, the normal curves differ in their variance – a measure of dispersion. Therefore, in a random sample of modern humans who are leaders of organizations, we will find significantly more males than females at the extremes – natural altruistic and very selfish. This leads us to the male-female frequency proposition.

Male-female frequency proposition: *In a random sample of organizational leaders, typically there will be significantly more males than females who are either naturally altruistic or very selfish leaders.*

Figure 5. More males than females at the extremes
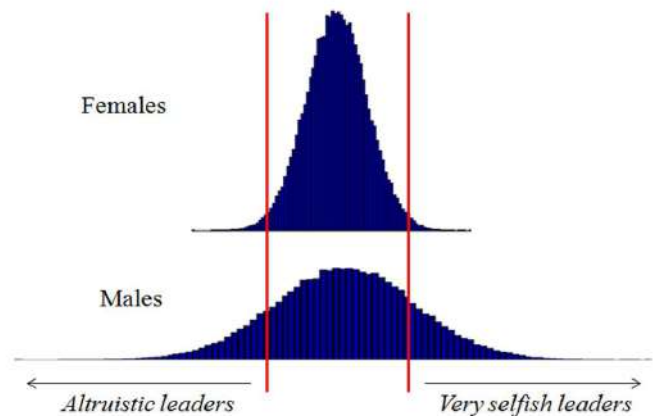
Notes: top = distribution of selfish leadership among females; bottom = distribution among males; normal curves at the top and bottom have the same total area under them.

The importance of this proposition, and the underlying rationale, comes from its elucidation of a scenario that would likely appear very counterintuitive to most people today, including leadership researchers. Let us say that a researcher wanted to find out if male leaders tend to be more selfish than their female counterparts. An analysis of very selfish leaders, showing a predominance of males, could lead to the conclusion that males tend to be more selfish. However, an analysis of predominantly altruistic leaders would also show a predominance of males, possibly leading to the opposite conclusion. From our discussion supporting the male-female frequency proposition, it is clear that neither conclusion would be correct.

5.3 Altruistic leadership signals and job satisfaction

In communication interactions among leaders and followers, leaders likely signaled regularly their willingness to accumulate resources and power to maintain their leadership position. Not doing so might have impaired their mating success, even if it helped increase their survival success. Thus, ancestral leaders, who were predominantly male, also generally had greater access to females. This created an inherent conflict among leaders and

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followers, since followers had latent selfish leadership traits. As a result, the signals sent by selfish leaders to followers are posited in our theory to have led to decreased satisfaction by followers with group belonging. In modern organizations, selfish leadership signals should thus lead to decreased job satisfaction among organizational members. Altruistic leadership signals should have the opposite effect [14, 21, 29, 40, 45, 48], which takes us to the *job satisfaction proposition*.

Job satisfaction proposition. *Altruistic organizational leadership signals will be positively associated with job satisfaction among organizational members.*

Note that we refer to altruistic organizational leadership *signals* because there is no visible indication other than behavioral signals that a leader is either selfish or altruistic. In ancestral populations, leadership style was conveyed to followers via communication and actions. This is generally true for modern organizations as well. Because of this, a leader of a modern organization can be naturally selfish, but send altruistic organizational leadership signals to the organizational members. In doing so, the naturally selfish leader will be able to positively influence job satisfaction. We believe that *natural* selfish leaders can become *trained* altruistic leaders, to the point that they are generally indistinguishable by followers from natural altruistic leaders. The importance of this comes in part from the fact that natural altruistic leaders are rare, previously stated in the *altruistic leaders' rarity proposition*.

5.4 Altruistic leadership signals and organization commitment

Altruistic leadership signals should also elicit organizational commitment in followers. When leaders display altruism, they signal to followers that they will consider others' outcomes and well-being in addition to their own. This signal, in turn, prompts followers to feel they can trust an altruistic leader and bring more of themselves to a situation and be more committed to an organization [4, 12 29, 40]. Such reciprocal trust-building seems deeply rooted in our evolutionary past when primitive humans had to decide who they could trust in day-to-day activities – people who could provide benefits for their own survival. They would thus want to belong to groups with those people in ancestral times and would be committed to remaining with those groups. In today's world, this would be expressed as commitment to certain organizations, which takes us to the *organization commitment proposition*.

Organization commitment proposition. *Altruistic organizational leadership signals will be positively associated with organization commitment among organizational members.*

Again, we hypothesize that altruistic organizational leadership *signals* will have a positive effect on organizational commitment among organizational members, whether those behavioral signals are displayed by a leader that naturally selfish or altruistic. A leader of a modern organization can be naturally selfish and still, with the proper training send altruistic organizational leadership signals to the organizational members. In doing so, the leader will contribute to increase the degree of commitment of those members to their organization.

5.5 Altruistic leadership signals and job performance

While we expect altruistic signals to directly affect organizational commitment and job satisfaction, the relationship between altruistic leadership signals and job performance comes from a more complex relationship (see Figure 6). We rely on prior empirical studies that examined the causal link between organizational commitment, job satisfaction, and job performance.

Figure 6. Indirect effect of altruistic leadership signals on job performance
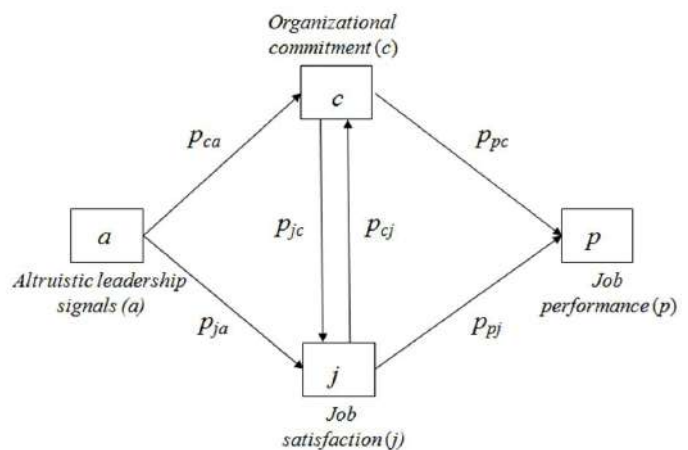
Several meta-analyses have provided evidence that both commitment and job satisfaction significantly and positively influence performance. Riketta [44] performed a meta-analysis of repeated measures designs, and found changes in commitment and job satisfaction to both precede changes in job performance, while changes in job performance had no significant link to later changes in either commitment or job satisfaction. Importantly for this study, Meyer et al. [36] found that the links between commitment and job performance were similar across multiple cultures – indicating a mechanism that transcends culture such as evolutionary forces. Similarly, Lok & Crawford [28] found across cultures that a more altruistic leadership style increased commitment and job satisfaction, and that both positively influenced each other.

Since job performance is a very important downstream construct in organizational research, hypothesizing a causal link between altruistic organizational leadership signals and job performance opens the door for much future research based on our evolutionary model. This causal link is formally stated through the *job performance proposition*.

Job performance proposition. *Altruistic organizational leadership signals will be positively associated with job performance among organizational members, with this association being mediated by job satisfaction and organization commitment.*

5.6 The advantage of trained versus natural altruistic leaders

Finally, we propose that trained altruistic leaders – those who have natural selfish tendencies but develop altruistic ones – will have workplace advantages over naturally altruistic leaders since they can draw on elements of a naturally selfish leadership style with external situations, and provide altruistic leadership activities when interacting with team and organizational members. When dealing with members inside their organization, trained altruistic leaders will engage in the same altruistic behaviors that naturally altruistic leaders exhibit. They will display understanding and empathy [2], which will elicit greater organizational commitment and job satisfaction from followers. Thus, we expect the same or similar follower performance levels from such leaders as natural altruistic leaders.

However, when dealing with competitors, these leaders can employ their natural selfish leadership traits against these competitors. Competitors can be seen as threats to the leader's organization, and, thus, her or his well-being. In such cases, the trained altruistic leader will revert to a more selfish behavior set and use this behavior to overcome such threats. In this way, a trained altruistic leader will exhibit different behaviors in different contexts – empathetic leadership with intra-organization members, and selfish leadership with competitive threats. This discussion leads us to the *natural-trained leadership proposition*.

Natural-trained leadership proposition. *Trained altruistic leaders are likely to positively influence organizational performance significantly more than natural altruistic leaders.*

6. Discussion and conclusion

In this paper, we presented a leadership theory based on evolutionary concepts. The basics of this theory propose that natural processes selected for selfish behaviors, and these selfish behaviors remain in modern humanity. However, while these selfish tendencies provided positive survival traits among ancestral populations, they (generally) act as a negative trait in modern times. Instead, altruistic behavior – placing followers' needs before one's own – elicits increased follower performance by boosting their organizational commitment and job satisfaction. However, it seems that the same forces that lead to the spread of selfish leadership traits would also inhibit the spread of altruistic leadership traits. As such, we can expect few naturally altruistic leaders to be available to increase performance in organizations.

However, we also expect that leaders can learn altruistic behavior and become trained altruistic leaders. Such leaders may even have an advantage over natural altruistic leaders because

they can draw upon two leadership styles – altruistic and selfish. Such leaders can employ altruistic traits internal to an organization (with followers and colleagues), while employing selfish traits with competitive threats. As such, organizations may want to develop training programs to help leaders develop empathy, and recognition of when to use their selfish traits and altruistic skills. For leaders who want to learn altruistic behavior, our advice is that they make an effort to display understanding and empathy [2] by using motivating language [30]. Essentially, their focus should be on praising positive job performance, as opposed to reprimanding negative job performance. The praise should achieve the same goal as the reprimand, namely highlighting the elements that led to enhanced job performance, but with better results overall.

We hope that future empirical research will test our model, both its specific predictions and the general idea of evolutionary traits' effects on selfish and altruistic leadership behaviors. A promising line of empirical research would be to investigate our theoretical model by exploring how it integrates with other areas of organizational research such as communication and diversity.

Future research should further develop and enrich our theoretical model. A prime question relates to gender and selfish/altruistic leadership. If both the selfish and altruistic leadership traits stem from evolutionary forces that tend to present extremes more in men than women, what does this mean for leadership and gender? It is possible that more women leaders tend to be trained altruistic leaders rather than natural altruistic leaders, and this could affect training and socialization practices in organizations. It may also be that female leaders already receive such socialization (at least those that reach higher organizational levels), and as such prove more facile in switching between leadership styles.

Another area of theoretical enrichment is how trained altruistic leaders switch between naturally selfish leadership behaviors and trained altruistic behaviors. Understanding such triggers will help our understanding of how leaders appropriately employ selfish tactics against external competitors, and also how inappropriate switching could cause leaders to employ selfish tactics against people internal to an organization. On a darker note, research could also explore how such leaders use selfish tactics against internal rivals, and the negative results from such behavior.

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