

Importance of a sense of control and the physiological benefits of leadership

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I write amid the frenzy of the September campaign season, when the airways are filled with politicians saying the same thing: They are willing to sacrifice themselves, to take on the terrible burdens of power and privilege, just to help us all. Alas, these individuals seem to have a certain outdated view about the physiological correlates of leadership, and a fascinating paper in PNAS by Sherman et al. (1) emphasizes this point.

Westernized humans predominately die of diseases of lifestyle and slow accumulation of damage. In trying to making sense of individual differences in health, it is easier to figure out that only the peasants who drank from a particular well came down with cholera than to identify what psychological attributes make someone more prone toward, say, cardiovascular disease. Amid this, it is clear that vulnerability to Westernized disease is sensitive to an individual's position in a social hierarchy (2).

Understanding health/hierarchy relationships was greatly distorted by a deeply flawed yet deeply influential study, namely, the report of the "executive stress syndrome." In work in the 1950s by Brady et al. (3), pairs of monkeys were exposed to intermittent shocks. Half could press a bar to delay shocks (i.e., were "executive" monkeys), whereas the other half were passively yoked to their executive, receiving the same pattern of shocks. The executive monkeys developed ulcers at a higher rate, fostering the view of leadership, responsibility, and executive control as pathogenic (3). However, the syndrome was an artifact: In a textbook demonstration of why subjects should be randomized, it turned out that more emotionally reactive monkeys had been preselected to be the executives, making them more prone toward shock-induced ulceration (4).

Careful work since then has revealed complex relationships between social dominance, physiology, and health among primates. Much of the work has focused on a class of stress hormones called glucocorticoids (the primate version is cortisol, also known as hydrocortisone). These hormones typify the doubled-edged quality of the stress response: Although cortisol is essential for an organism to survive an acute physical stressor (e.g., fleeing a predator), chronic cortisol hypersecretion

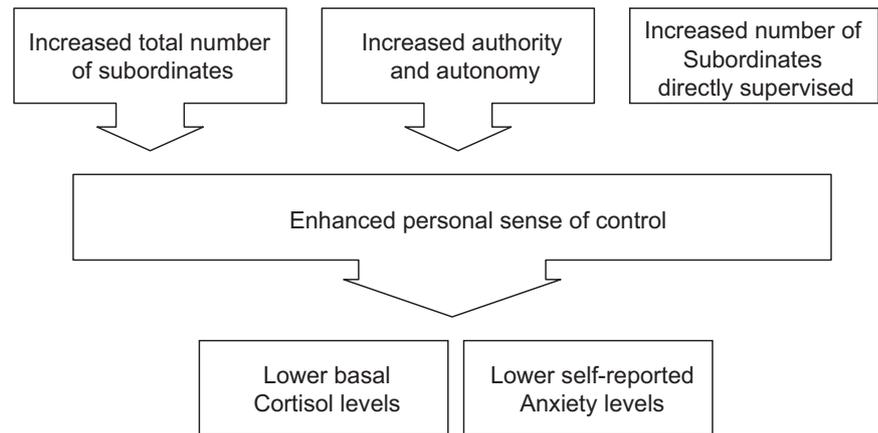


Fig. 1. Overall, insofar as leadership gives rise to an enhanced personal sense of control, it gives rise to the low-cortisol and low-anxiety levels. However, all components of leadership give rise to the salutary cortisol and anxiety profile. Leaders who had larger number of subordinates in their organization, and who had high levels of authority and autonomy, had the enhanced sense of control. In contrast, having a large number of subordinates directly supervised was not enhancing.

due to psychosocial stress contributes to many stress-related maladies (e.g., hypertension, depression, reproductive impairments). Thus, in the absence of stress, the optimal health profile is one in which basal cortisol levels are low (5).

An array of studies collectively show that basal cortisol levels in nonhuman primates do not so much reflect social rank as the meaning of social rank in a particular species and social group. For example, cortisol levels tend to be lower in dominant than subordinate animals in species in which high rank is maintained by intimidation and high-ranking individuals can aggressively displace frustrations onto subordinates with impunity. In contrast, it is subordinate individuals who have the lowest levels of cortisol in species in which maintaining high rank requires frequent fighting (6, 7).

Equivalent studies in humans have been challenging. As one difficulty, humans belong to multiple hierarchies (such that, e.g., someone can have both a lowly position in a corporation while being a respected leader in his or her church), and, typically, most value the one in which they rank highest. Moreover, humans have vast psychological means to rationalize the meaning of their rank. Finally, short of the sledgehammer subordination of extreme poverty, ranking systems in Westernized humans are typically not physiologically or ecologically "real," in that they do not influence one's ability to, say, obtain ade-

quate calories or protection from the elements; it is not the case that midlevel corporate executives, consigned by their rank to having access to only poor-quality plants and roots, must forage more hours each day than upper management. Amid these challenges in studying rank/health relations in humans, the new work by Sherman et al. (1) offers some clear, important findings.

The authors study a population of governmental and military leaders who had been sent to an executive training program. Subjects came from a range of midlevel ranks (e.g., officers up to the rank of colonel in the army); had been in leadership positions for an average of more than 3 y; and were presumably well-regarded, given their selection by their organization for this honor. As the key findings, compared with age, sex, and ethnicity-matched nonleader controls, and after controlling for lifestyle health factors (e.g., diet, level of exercise), leaders had substantially lower resting cortisol levels and lower levels of self-reported anxiety. Thus, within this example of hierarchical stratification, high rank carries physiological and psychological advantages.

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Of note, although both low-cortisol and low-anxiety levels correlated with leadership, neither was correlated with the other. This supports a literature that links anxiety more closely to elevated activity of the other main branch of the stress response (i.e., the sympathetic nervous system and epinephrine secretion) than to elevated cortisol secretion (8).

The study reported additional, subtle findings. One concerned a critical mediating psychological variable in the leaders. An extensive literature shows that for the same external stressor, subjects feel less subjectively stressed, activate less of a stress response, and are less at risk for a stress-related disease if they feel a sense of control (9). Commensurate with this, leadership was associated with an elevated personal sense of power on a psychological inventory given to subjects. Importantly, a mediational statistical analysis showed that leadership was associated with low cortisol and anxiety only insofar as it was associated with an enhanced sense of control.

Being a leader is not a monolithic state, with the demands and rewards differing in different settings, something that Sherman et al. (1) then explore. Subjects indicated (a) the number of individuals subordinate to them at work, (b) the number of subordinates who they directly managed, and (c) their level of authority and autonomy (e.g., whether they could promote or demote subordinates). From that came a fascinating finding.

Both having a greater total number of subordinates and greater levels of authority were associated with a greater sense of personal control, as well as with lower levels of cortisol and anxiety; this certainly makes intuitive sense. However, having a greater number of subordinates to manage directly was not associated with those salutary psychological and physiological end points (Fig. 1). This lends

support to the stereotypical bellyaching of the office manager who says, "It's not so much that I'm the boss of X number of people; it's more like I have X number of bosses." From the standpoint of a leader's health and psychological equilibrium, it is better merely to have lots of people

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merely smile obsequiously when you saunter through the office than to have to supervise them.

Naturally, this excellent study prompts further questions. First, there is the great unknown in a correlational study such as this, which is the question of whether high rank precedes low cortisol and anxiety, or the other way around. The study cannot give much insight into this, given that the leaders had all been in their positions for a number of years (although cortisol levels were not lower the longer the individuals had been in their ranks). Addressing this issue would require a gold standard prospective study, determining whether physiological/psychological profiles in nonleaders identify those destined to rise in the ranks, and what changes in those end points occur soon after promotion.

Another issue for future studies concerns the stability of rank. The physiological and psychological advantages of high rank disappear when that rank and/or the overall hierarchy are unstable (e.g., in human studies, when there are threats

of layoffs or bankruptcy) (6, 7). Neither condition was met in the present study; as noted, subjects were all entrenched in their leadership roles, and neither the government nor the military seems likely to go out of business soon.

There exist complex sex differences in the realm of stress and health, ranging from nuts and bolts biology to psychosocial and cross-cultural factors (e.g., 10). In the present study, there was a roughly even split by sex between both leaders and nonleaders. Hopefully, Sherman et al. (1) will subsequently explore any sex differences in the rank, cortisol, and anxiety relationships in this dataset.

Finally, a recent study of a population of wild baboons showed something particularly subtle (11). Amid the 10–20 males in each of the five troops monitored, there was a linear relationship, such that the higher the rank, the lower were the cortisol levels. . . until considering alpha males, whose levels were elevated into the range seen among omega males. In this population, alpha males spent more time fighting and in sexual consortships (during which the male does little eating) than did beta males; the authors suggested that the energetic consequences of this produced the elevated stress response. A similar fine-tuned analysis of individual ranks awaits further study in a human population, such as the one in the present study.

Sherman et al. (1) generate important insights into the relationships between the psychology and biology of leadership in humans. As a final bonus, the work offers an immediate practical benefit for this campaign season: If a politician asserts that his adrenal glands have hypertrophied but that this is a sacrifice he is willing to bear for the rest of us, consider this a good indicator that anything else he claims should be viewed skeptically.

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