

FOSTER A CULTURE THAT EMBRACES
INNOVATION, FUELED BY AIRMEN

How the Neuroscience of Leadership Enables a Culture of Innovation

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Conventional Wisdom versus Research

If you ask 1,000 people what good leadership looks like, you'll likely get 1,000 different answers. Some might say it's about commanding authority and demonstrating power. Others might say it's actually about guiding with a quiet hand.

We hold these disparate beliefs because the concept of leadership forms early on in our minds, as children (Hawley, 1999). Moving through the world, we unconsciously begin sorting people as “leaders” and “followers,” deducing who makes and enforces the rules, and who merely abides by them (Sy, 2010). Over time, our lived experience builds on this initial foundation, until our own style of leadership becomes a mosaic of personality, intuition, conventional wisdom, mentorship, and incentive.

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Over the past two decades, however, the NeuroLeadership Institute (NLI) has detailed a fundamental and comprehensive understanding of leadership that can be ascertained through the discoveries from the field of neuroscience. Rather than default to what conventional wisdom says we ought to be doing, the field of neuroleadership compels us to make decisions based on the insights drawn from empirical research. What we've found over the years is that if you can understand how the brain works, you'll necessarily be in a better position to understand how to inspire people, spark creativity, share and listen to new ideas, and have challenging conversations that remain productive. In other words, you'll understand how to lead (Mumford et al., 2007).

In this article, we give an overview of the value neuroscience brings to leadership, explain how a science-based approach can foster a culture of innovation, and explore how all this pertains to developing future leaders, specifically cadets at the United States Air Force Academy (USAFA).

Brain Science as the Foundation for Leadership

Many findings from human cognitive and social neuroscience offer valuable contributions to our understanding of leadership. Decades of research have shown that certain stimuli will produce repeated neural signatures in the brain. For instance, the expectation of reward has long been shown to trigger the release of the neurotransmitter dopamine, which compels us to seek further rewards (see Wise & Rompre, 1989).

This kind of empiricism does not traditionally dominate the larger conversation around building effective leaders, but it is a natural fit. The suite of complex cognitive skills that make for effective leaders can largely be described in terms of stimulus and response. In other words, if leaders have an idea of what is going on inside their own minds and the minds of their teams, they'll be better armed to make the right decisions in the moment (Bratton et al., 2011).

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With empiricism acting as our guide, we can revisit how leadership is generally described in academic settings. In the literature, leadership is described as a social influence process (Forsyth, 2015). Hence, individuals and groups must recognize and respect that “leadership” is an idea in the minds of followers (Emrich, 1999), and that the leader’s actions, decisions, and behaviors regulate the degree of influence they can have on others.

What that means is leadership is not always synonymous with a person’s position on the organizational chart. People at the very top of the organization can demonstrate a lack of leadership, while those at the bottom can show a great deal. Indeed, as far as the literature is concerned, hierarchy matters less than influence. For instance, a wide body of research shows that people unconsciously adopt the behaviors and emotions of one another (McDonald, 2015), in particular the highest-status member of their group (Maccoby, 2004). If this person begins to panic, the team is more likely to panic as well. If this person remains calm, the team remains calm. In the workplace, typically this highly influential person is also the highest-ranking, which helps explain why we show greater deference to people of increasing authority. But it is true that leadership, and therefore influence, can exist at all levels within a hierarchy. From this starting point, we can ask an important question: Out of all the effects a leader can have on their team, what effect does science suggest leads to the best outcomes?

Social Threat and Reward

The brain is an incredibly complex organ, and it performs a variety of fundamental functions to keep us alive—for instance, threat detection. At every waking moment, the brain is assessing whether what we experience poses a danger to our survival. Thousands

of years ago, this mechanism served us well for keeping our bellies full and protecting us from predators looking for their next meal.

Over time, as humans evolved out of the food chain, our system for threat-detection evolved along with us. Even if we don’t face any risk of getting thrown into the lion’s den, many of the threat-detection mechanisms are still hard-wired in our brain. We still feel a palpable sense of threat and reward in purely social situations, such as when the boss criticizes our idea in front of the entire team, or when he or she publicly celebrates a job well done. Importantly, these social threats and rewards yield similar effects in the brain as physical threats and rewards (Eisenberger & Cole, 2012). If we perceive a threat, the performance of the prefrontal cortex gets temporarily impaired, dampening the parts of our brain used for reason and critical thinking (Ossewaarde et al., 2011). If we perceive a reward, we feel a burst of cognitive control, which may manifest as excitement and motivation (Botvinick & Braver, 2015).

Threat and reward don’t compete in the same cognitive weight class, however. Threat is much stronger because threat has much more dire consequences for our survival than reward does (Baumeister et al., 2001). For example, missing nice, ripe berries in the forest is a letdown, but mistaking a stick for a snake can kill. It’s no wonder, then, that we forget about the compliment someone paid us five minutes ago, but we stew over the nasty remark someone made last week. Such is the power of social threat.

In general, leaders have a responsibility to minimize the sense of threat felt by their teams, and to maximize the sense of social reward, from the most casual of one-on-one chats, all the way up to company-wide policies that permeate an organization’s culture.

The Importance of Common Language

Already we're starting to see a benefit of brain science in leadership from research on common languages within high-performing organizations. When we use the same terms to describe phenomena, such as a person's apparent burst of excitement after receiving praise from a manager, we can feel more confident that everyone involved is indeed talking about the same thing. In the most extreme cases, this is how organizations come to embody the stereotype of "corporatese," in which members adopt the same jargon-filled vocabulary and unite around key buzzwords. People can also unite around shared understandings of scientific language and concepts.

Without this common language, teams risk having discussions in which individuals all think they're being clearly understood, and yet each person interprets the discussion differently (Cabre, 1999). The benefit here isn't just stronger interpersonal connections, but stronger neurological ones. Studies have shown that two people having a conversation show increased alignment in brain activity, especially when they can predict what the other person is about to say (Dicker, 2014). It's not just a metaphor, in other words, to say we want to "get on the same wavelength."

Creating a Culture of Innovation

So, how can leaders apply social threat and reward, and extract the value of a common language, to develop a culture of innovation? Let's start, once again, by defining our terms.

Many leaders tend to conflate culture with the values and priorities they set for their organization—what they aspire to be. However, there is a fundamental gap

between knowing and doing (Pfeffer & Sutton, 2000). This discrepancy is known, fittingly, as the "knowing-doing gap," and it states that just because we aspire to do something doesn't mean we will do it. When our intentions or goals are ambiguous and unspecific, it is very cognitively taxing for us to be able to act toward reaching that goal. We simply do not know what action to take or behavior to exhibit to shorten the distance between what we want and how to get there.

NLI's definition of culture aligns more closely with the actual behaviors that get carried out by a large number of people on a regular basis—their shared everyday habits. For instance, teams that show up early and stay late have developed a culture of determination, or over-work, depending on your perspective. Teams whose members regularly check in with one another and ask how they can help may be said to have a culture of cooperation and support. The same logic applies to innovation. An innovative organization is composed of people performing the behaviors that foster innovation. Some of these behaviors are directly related to the transformational leadership concept of intellectual stimulation which prescribes "questioning assumptions, reframing problems, and approaching old situations in new ways." (Bass et al., 2003, p. 208). In this manner, threats such as ridicule are minimized and rewards such as praise and encouragement are maximized as solutions to problems are sought from all members of the team and not just those not in positions of authority.

While full-fledged innovation requires the persistent re-evaluation of ideas and resources, based on our research at NLI, we have identified at least two active ingredients that make innovation more likely in a given team: diversity and growth mindset.

Creating New Behaviors

Research shows that organizations with greater diversity of race and gender are more likely to be more effective, more creative, and generate more financial returns than more homogenous organizations (Hunt, 2015). Why? Because diversity causes friction, and in that friction, is where team members can cut through the assumptions and biases that lead to barriers like groupthink. Diverse teams—and specifically those that work hard to act inclusively—tend to solve problems from more angles, with greater scrutiny, and with fresher perspectives than more homogenous teams (Hunt, 2015). In the short-term, this can have the downside of making diversity a somewhat challenging experience. Diverse teams disagree with one another more. Meetings don't become feel-good echo chambers. But if teams are willing to exert that effort, and navigate that discomfort, the long-term benefits are clear. On the other side of disagreement is a clearer understanding of one another's positions and more effective decision-making in general (Price, Cappella & Nir, 2002).

At the same time, innovation, in many ways, depends on whether people can approach the process with a growth mindset. This is the belief that skills and abilities can be improved, and that developing our skills and abilities is the purpose of the work we do (Derler et al., 2018). Opposite a fixed mindset, which is the notion that people's skills are fixed from birth, a growth mindset thinking compels us to continuously develop our own, and other people's skills and abilities, as well as to experiment, take risks, and view failure not as an end point, but as a necessary component of success. Leaders can actively encourage their organization's collective mindsets by demonstrating certain behaviors that express a growth mindset: highlighting progress

over perfection, publicly exploring new ideas and learnings from others, or talking openly about what has been learned from past failures. Organizations such as Microsoft, HP, Cigna, and Telenor have all been using the concept of growth mindset as a cultural imperative for years, as they strive at being more adaptive, innovative, and most importantly, to enable their employees to be life-long learners who won't shy away from difficulties and change (Derler et al., 2019).

Taken together, teams that actively seek diverse perspectives and work to instill a growth mindset in their members—and reinforce these terms as vital and alive—can gradually begin to start creating a culture of innovation through their daily habits. They will gather new ideas from disparate sources within the organization and they will keep an open mind about what kinds of solutions are appropriate for a given problem.

Not to mention, they should expect to reap benefits of deploying this common set of frameworks organization-wide, as we saw with social threat and reward. Over time, people begin attending to wholly new aspects of their work. They encounter familiar problems with a newfound sense of opportunity, not resignation. They hear ideas once viewed as odd or far-fetched now as novel and creative. And on an ongoing basis, their own continued use can start encouraging others to do the same, multiplying a lone behavior into a company-wide culture.

Applying the Research to Developing USAFA Cadets

So why does this matter to those who serve at USAFA? To examine this question, we must first look to USAFA's mission statement: "To educate, train and inspire men and women to become officers of character motivated

to lead the United States Air and Space Forces in service to our Nation” (USAFA, 2020). Implied in this mission statement is the requirement for these men and women to strive for the United States Air Force (USAF) third core value of “Excellence in All We Do... to meet or exceed standards objectively based on mission needs and continuously search for new and innovative ways to successfully accomplish the mission” (USAF, 2015, p. 17). Clearly, the USAF believes that the ability to innovate is of value to future officers.

Having addressed that question, the next question, then, is how do we develop the ability to innovate among cadets, specifically an ability to value and leverage a growth mindset and diversity? If we believe the science concerning how people react to threats and rewards, and we desire the continuing development of an innovative ability of USAFA’s cadets, then it follows that USAFA should act in a manner that limits threats to developing this ability and maximizes rewards of it. In essence, those who serve at USAFA should develop and exhibit habits of behavior that facilitate a culture which values fostering innovation. How we do this will occur at multiple levels of leadership, to include how we act as individuals and lead ourselves, how we serve as members of teams, and how we craft policy at the organizational level.

Let’s first delve into examples of these actions by starting with the highest ranking member of the USAF, current Chief of Staff (CSAF), General David Goldfein. At the Air Force Association Air Warfare Symposium in February 2020, and as reported by the Air Force Magazine, Elon Musk stated, “The fighter jet era has passed.” Now those of us acquainted with the past or current USAF culture may view Musk’s statement as brash. However, despite what some may claim as the views of a heretic, General Goldfein “leaned in to hear what followed” (Cohen, 2020, p.

20), when instead he could have acted by cutting off Mr. Musk and setting this perceived wrong “right”. While this example occurred at the individual level of leadership, it spoke volumes in terms of how the highest ranking Airman in the USAF listens to new ideas.

This subtle example can be easily translated to the USAFA context. However, it is worth noting that due to its hierarchical design, the nature of USAFA and the USAF at large with its “chain of command” creates an authoritative culture that is resistant to disorder. This can be both effective and ineffective depending on each individual unit’s mission and subsequent situations. For instance, an authoritative culture reinforces our expectations of Airmen during the immediate employment of weapons—innovation is not desired, rather they are trained to run checklists and follow certain procedures. On the other hand, if Airmen are tasked with solving problems with unknown solutions, then how would one follow a checklist?

Returning once again to the CSAF example, General Goldfein leveraged both diversity and a growth mindset. He invited the diverse perspective of an “outsider” and listened to a new way of viewing the era in which the USAF operates. At USAFA, we can take a cue from the CSAF’s example. At the individual level, we all can better value the power of diverse thought and be more accepting of new ways of accomplishing the mission. This is especially salient when accomplishing the mission means coming up with unknown solutions.

For instance, let’s say a cadet is struggling to select an academic major and he or she comes to you for advice. For this cadet, this is an individual leadership problem with an unknown solution. In order for you to help the cadet solve it, you could simply say, “Pick the major that you think will get you the highest grade point average,” knowing that this performance metric

carries significant weight in determining options available for this cadet. On the other hand, to leverage those behaviors that foster innovation, you could say, “It depends on which major you think will best develop you for your officer career, and I think you should also consider talking to others about this before you make a decision.” While this approach would be more innovative, it could increase threats and decrease rewards in terms of potentially lower grades.

While this example speaks to behaving innovatively at the individual level, it raises the question of why this potential threat of lower grades would be present from an organizational perspective. If USAFA aspires to develop cadets to be the most effective and innovative officers, would we not also want them to select a major that would give them the tools to achieve this goal? Put another way, if there are existing organizational rewards that reinforce a fixed mindset, should we be surprised if we don’t always achieve our desired outcomes? Without rewards embedded within organizational policy, it is likely that threats to the kinds of innovative behaviors we seek will endure. In order to make this happen, policy changes may be necessary.

Here is another example. If the institution seeks to supply the USAF with pilots, we have a pretty good idea from over 60 years of experience what kind of recruit has the highest propensity to choose this career field. However, strictly recruiting toward this target could adversely impact diversity, potentially rendering USAFA ill-prepared to meet new requirements or engage in the kind of innovative thinking needed to anticipate and solve emerging problems. While a solution to this challenge is outside the scope of this paper, it serves as an example of how policy can threaten or reward a desired outcome, as well as how a growth mindset itself can be the mechanism that could help derive the answer.

Let’s end with a final hypothetical example that involves fostering innovative behaviors at the individual, team, and organizational levels of leadership. USAFA’s Honor Code states, “We will not lie, steal, or cheat, nor tolerate among us anyone who does.” For the sake of this example, let’s assume that at some point in their tenure, a cadet violates the code, but the violation goes unreported. Not only is the toleration clause undermined, but there is also a lost opportunity to develop that cadet. In order to improve the program that engages cadets in a manner that challenges their habits and supports their development, the Superintendent has assembled a task force to examine the issue. The Superintendent wants to reduce these infractions, but is also open to exploring other more innovative solutions.

Given this charge, the task force begins by interviewing a sample of cadets. Throughout the interviews, cadets explain that they are afraid to report their violations due to the threat of being kicked out. In addition, they say that cadets cover for each other because they value loyalty. In terms of a solution, the cadets think the threat of being kicked out shouldn’t be a standard for self-reports or admitting to a violation when confronted, but only for those who denied the accusation and were later found in violation. Finally, most cadets think it would be valuable if they could access mentors to discuss honor violations without fear of reprisal. However, other cadets think that no matter the circumstances, the presumptive sanction for any honor violation should be disenrollment.

Hearing this, the task force next interviews a sample of faculty and staff. This group corroborates the assumption that many violations go unreported. Some agree with the current policy and some do not; however, most feel that they would be open to discussing violations with cadets as well as how to learn from

them. Last, the task force interviews a group of USAFA alumni. Some in this group agree to the assumption and some do not. Some agree that being kicked out has always been the standard and the circumstances of the violation should not matter, while others see room for changing the standard. In terms of solving the problem, ideas range from increasing the fear of disenrollment to minimizing the fear by eliminating the policy all together.

With this information in hand, the task force presents to the Superintendent several potential solutions to the problem. He thanks the task force for questioning assumptions, reframing the problem, and looking at new ways of approaching old problems. The following week, the Superintendent rolls out a new honor policy which is radically different than before. This innovative solution was enabled through a culture shift at how individuals, teams, and organizations viewed the problem. At the individual level, when the task force interviewed cadets, USAFA members, and alumni, they listened to the various perspectives rather than discounting one over another. When the task force worked as a team to provide potential solutions, they left no option off the table and included the full range of sanctions as presented by the interviews. Leveraging this diverse perspective and a growth mindset, the Superintendent was able to create an innovative policy at the organizational level of leadership to reward behavior more aligned with being a leader of character. Clearly, this is offered as an illustrative example of an innovative approach and not as a suggestion that improvement is necessarily needed regarding the Honor Code.

Conclusion

NLI's brain science research indicates that the more we pay attention to how people's minds function, the

better equipped we will be as leaders. Thus, when the mission at USAFA is to "educate, train, and inspire" men and women to become officers of character, insights from neuroscience can inform how we develop courses, programs, and experiences, as well as the policies that govern them.

There are incremental steps we can take to continue to steer USAFA's orientation toward innovation, whether at the individual, team, or organizational level. However, USAFA leadership will need to take into account many legacy policies that influence recruiting, admissions, curriculum, and accessions, which could impact diversity and a growth mindset. Knowing that these attributes are ingredients in a culture of innovation is not enough. Threats to diversity need to be examined and rewards expanded. Creating new policies that allow for a wider range of graduate attributes, as well as encouraging alternative paths to graduation could have a positive impact on diversity recruiting, experimental curriculum, experiential learning, and other less-traditional programming. With some subtle shifts in policy and risk acceptance, USAFA faculty, staff, and cadets may begin to see opportunities to alter individual behaviors as well as interactions with others. In doing so, they could cultivate newfound innovative abilities. Having a growth mindset and diversity of thought can continue to expand such as to become the norm. Ideally, it will become commonplace to encourage each other towards innovative pursuits that push comfort zones and expand capabilities. Doing so will help transform innovation from being merely an idea, into an organization-wide habit.

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