Pilots with the 33rd Fighter Wing prepare to take off 26 August 2016 during exercise Northern Lightning at Volk Field, Wisconsin. Northern Lightning is a joint total force exercise that gives the Air National Guard, Air Force, and Navy a chance to practice offensive counterair, suppression and destruction of enemy air defense, and close air support. (Photo by Senior Airman Stormy Archer, U.S. Air Force)

Learning Organizations

Transforming U.S. Air Force Squadrons from Masters of Adaptation to Engines of Innovation

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There is little doubt that Chief of Staff of the Air Force Gen. David L. Goldfein believes in the power of squadrons—but do they deserve it? Goldfein highlighted squadrons in his first focus paper as chief of staff, underscoring his desire to revitalize what he terms "the beating heart of the United States Air Force; our most essential team."[1] Action followed words, with immediate reductions in additional duties and an increase in authority for commanders to decide what tasks were mission critical. These changes were designed to focus squadrons on their core missions, instead of the myriad of institutional requirements that encroached on, and even threatened, mission accomplishment.[2]

Renewing mission focus at the squadron level is both laudable and necessary. As Goldfein stated, "we [the United States Air Force] succeed at our mission at the squadron-level because that is where we develop, train, and build Airmen."[3] The question is, once squadrons recapture their misspent resources, what will they do with them?

In that same document that concentrated efforts on squadrons, Goldfein labeled squadrons the "engines of innovation and esprit de corps. Squadrons possess the greatest potential for operational agility."[4] However, there are significant differences between innovation and adaptation. This article argues that years of war and institutional mission creep have turned squadrons into masters of adaptation, and a new mindset is necessary to encourage innovation. While the differences between adaptation and innovation seem a matter of semantics, there are significant disparities (see table 1, page 4). Adaptation, while vital to mission success, focuses squadrons on immediate problems and inhibits opportunities to increase far-sighted decision-making. Innovation, on the other hand, looks beyond immediate issues, focusing squadrons on their core missions and unleashing their "potential for operational agility."[5]

The difference between adaptation and innovation is crucial, though not commonly understood. This article seeks to merge and leverage multiple learning theories taken from both corporate and military-focused literature. The purpose of blending theory in this manner is to delineate between the key concepts of reactive and proactive learning as applied to adaptive and innovative organizations. The delineation of concepts is then overlaid against a squadron's ability to step back from the day-to-day pressures and maximize its operational capability. The intent is to provide a framework for evaluating the changes made to Air Force organizations as well as to provide a case study for other military organizations desiring to shift from adaptive to innovative.

Learning Theory

The use of learning theory in general, and specifically as applied to operational capability, owes much of its current relevance to Harvard Business Professor Peter Senge. His book, *The Fifth Discipline: The Art and Practice of The Learning Organization,* defines a learning organization as "organizations where people *continually expand their capacity* [emphasis added] to create the results they truly desire, where new and expansive patterns of thinking are nurtured, where collective aspiration is set free, and where people are continually learning to see the whole together."[5] Indeed, it is the duty and responsibility of the military to "expand their capacity to create the results they truly desire."[6] Likewise, doing so may require "new and expansive patterns of thinking."[7] Though Senge's theory is business-driven, his references to the conformist and change-resistant nature of corporate culture are echoed in the conservativism of military culture.[8] Both views discourage wholesale change and the associated disruption.

Yet not all learning organizations "expand capacity" in the same way. Senge argues that there are "adaptive" and "generative" learning organizations.[9] Adaptive organizations are reactive. Sometimes labeled *catastrophic learners*, organizations adapt in response to urgent stimuli preventing them from meeting immediate requirements. Conversely, generative learning is proactive. Rather than responding to immediate problems, generative learning effects organizational seeks to improve future operations. In short, an urgent crisis is not required to spur organizational change.

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This does not mean generative learning organizations are incapable of responding to urgent crises; rather, most generative organizations are also adaptive. What it means is that while able, generative organizations are not restricted to a reactive methodology. In fact, one common example of generative learning is when an organization applies adaptive change in one area to other, seemingly non-connected, areas to enhance capacity.[11]

In "Improving in War," Theo Farrell, professor at the Department of War Studies at King's College, applies Senge's adaptation model and highlights two key characteristics of military adaptation. Military organizations "*exploit* core competencies in refining or modifying existing tactics, techniques and/or technologies."[12] They also "*explore* new capacities by developing new modes and means of operations."[13] Both characteristics share the common thread of enhanced resources. Integrated with the reactive nature of Senge's adaptive learning, military adaptation translates into the reactionary adjustment in the use of current resources to overcome a crisis or threat to mission. While the new capacities can indeed increase mission effectiveness, the reactive nature of this capacity fails to meet the *Air Force Future Operating Concept* definition of operational agility as a means of "seizing and retaining the initiative in conflict."[14]

To achieve true operational agility, a military organization must move beyond adaptive change and do more than refine processes and modes of operations. Senior RAND researcher Adam Grissom argues that military innovation (vice adaptation) must demonstrate three key characteristics. First, change must occur within the operational forces and not just the bureaucracy. Second, change must have a substantial impact on operations. Third, change must result in military effectiveness. Effectiveness is the key to Grissom's theory.[15] The first two criteria can hold through a military disaster or bungling, while innovation is inherently concerned with improving operations.[16] English military historian and author Corelli Barnett summarizes this concept as "a change in operational praxis that produces a significant increase in military effectiveness."[17]

The effectiveness of change is also influenced by context. Williamson Murray, Ohio State professor emeritus of history and strategic studies initiative adjunct professor, argues that the character of learning

Air Force Chief of Staff Gen. David L. Goldfein speaks on the value of airmen to the Air Force mission 10 February 2017 during the Black Engineer of the Year Awards Science, Technology, Engineering and Mathematics Conferences' Stars and Stripes ceremony in Washington, D.C. (Photo by Scott M. Ash, U.S. Air Force)

is dependent on whether or not a nation is at war. He posits that innovative change can only occur in peacetime when the necessities of war are not present. Adaptive change is endemic in wartime, as one's forces are constantly reacting to the adversary.[18]

The constant pressure of adversary reaction characterizes Murray's definitions of adaptation and innovation, but in his formulation, the definitions are anchored by the concepts of feedback and immediacy. Murray argues that adaptation is characterized by limited time and the constant feedback of combat. In today's environment, this can manifest as actual enemy action (in a deployed environment) or the myriad pressures outside a unit's span of control. These pressures not only provide a limited window to adapt but also drive a constant stream of adaptation. After all, adaptation is not limited to a single unit. As that unit adapts, outside pressures counter-adapt. One example is a cost-saving method of maintaining aircraft. The new technique may save money; however, that money

Table 1. Distinctions between Adaptive and Innovative Learning Organization Traits

Learning Organization Categories	
Adaptive	**Innovative**
Reactionary	Proactive
Confined to part of the organization	Spread across the organization
Limited resources	Utilizes organization-wide or new resources
Allows mission accomplishment	Improves operational effectiveness
Time limited by adversary	Time limits self-imposed
Immediate feedback based on adversary reaction	Feedback based on tests/evaluations against perceived threats

(Graphic by author)

now flows into another program, placing the unit in the same fiscally constrained position it previously held.

Saving money through adaptive learning is not a generative process that redirects funds towards priorities. It simply holds funds for the next crisis that triggers adaptation. Innovation, on the other hand, is characterized by the time to think through problems and the lack of an "interactive, adaptive opponent."[19] This is because time limitations are self-imposed versus adversary imposed, driven by internal rather than external pressures. Additionally, innovation substitutes the immediate feedback of adversary response with tests and evaluation. Moreover, while adaptation addresses an immediate problem, innovation attempts to address a future, envisioned challenge, which is a more difficult to achieve feat of imagination and analysis.

Adaptive change, also called catastrophic change, is a direct result of adversarial action. It is a reaction to unanticipated conditions of war, and takes place as one battles immediate pressures with the resources at hand. Feedback is equally immediate, flowing from operational effectiveness and the adversary's reactions. The dynamic of adaptation-reaction creates a reinforcing loop where adversary reaction prompts adaptive counterreaction, generating constant adaptation. Finally, as the goal of adaptive change is to stay a step ahead of the adversary, it generally results in limited change across some, but by no means all, of an organization's resources.

Conversely, innovative change is proactive and is not spurred by immediate pressures. Innovation utilizes an evaluation of past events to provide generative, whole-of-organization solutions to future problems. Given the luxury of time, these solutions may incorporate additional resources, provide new material solutions, or even reroute saved resources back into the organization. Feedback flows from self-imposed tests and evaluations based on one's perception of the future threat rather than the real-world crucible of adversary action. Because of this, innovation is an incomplete answer that often requires some adaption upon contact with the adversary.

Adaptation and Innovation in Air Force Squadrons

Constant deployment pressure and institutional mission creep have created an environment in which Air Force squadrons are forced to continually adapt in the face of immediate pressure rather than innovating for the future (see table 1 for adaptive vice innovative traits). Externally, a combination of low manning and high operational tempo created a reactionary force where leadership had to prioritize between threats. Internally, commanders had to account for the institutional pressure of over 1,100 directive Air Force Instructions and sixty-one separate squadron-level additional duties.[20] Together, these factors created a crushing environment focused on the now.

The sense of "now" is encapsulated in Air Force Instruction 38-402, *Airmen Powered by Innovation*, which actually seems to discourage squadron-level innovation. It specifically labels ideas already discussed with management (defined as "an individual who has the authority to pursue or give submitter

approval to pursue the idea") as "After-the Fact Ideas."[21] Once a member has presented their idea, they have just ninety working days to submit ideas to Airmen Powered by Innovation (API) programs. Though this guidance is likely designed to assist higher levels of command apply widespread changes across multiple units, that distinction is not specified. Since API provides monetary rewards for results, this effectively negates low-level commanders' abilities to test and evaluate multiple solutions, smothering squadron innovation in the name of greater higher headquarters efficiency. If Goldfein's assertion that squadrons are the engines of innovation is true, then API as it stands now is a powerful governor holding them back.

Another governor limiting squadron innovation is the Air Force's officer evaluation system. Nominally, these evaluations are holistic assessments spanning an entire reporting period, but in reality, a single failure can disproportionately influence reports and, under the current Air Force promotion system, have an equally disproportionate effect on a career.[22] The power of a single event rises from a cognitive bias known as the availability heuristic, where a single memorable instance can outweigh a mass of events that fail to challenge mental norms. In this context, one failure stands in sharp contrast to the unblemished service that placed an officer in command.[23] When combined with the Air Force's hypercompetitive up-or-out promotion process, leaders have little incentive to risk their stratification.[24] Given this reality, the testing and evaluation of new ideas, and the inevitable failure true innovation entails, such risk-taking seems foolhardy.

Transforming Squadrons

Despite institutional roadblocks, the Air Force's renewed focus on squadrons is an opportunity for leaders to foster innovation. Goldfein's reduction in additional duties is already providing relief from day-to-day minutia while the planned addition of 1,600 commanders support staff personnel is aimed at reducing the administrative overhead that detracts from Air Force squadron's core missions.[25] The key question now becomes to break out of the adaptive mindset and become components of an innovative organization.

Transforming squadrons into "engines of innovation" requires three key efforts: leadership buy-in, prioritization, and a squadron culture that embraces innovation. The first step toward transformation, leadership buy-in, begins with the squadron commander. Air Force Instruction 1-2, *Commander's Responsibilities*, places the commander firmly in charge of leading people and managing resources.[26] Without his or her buy-in, innovation is dead in the water. Almost as important, and more often forgotten, is higher headquarters buy-in. Squadron commanders must communicate their vision to group-level, or even wing-level leadership. Innovation can be messy. Unlike adaptation, innovation's goals may not be self-evident, and leveraging resources across an organization can disturb ongoing processes. Unfortunately, solutions may fail their first tests. Group support can be the difference between seeing those failures as inevitable steps toward greatness or another set of headaches coming from the new problem squadron.

Table 2. Sources of Learning Anxiety

Sources of Learning Anxiety
Fear of loss of power or position
Fear of temporary incompetence
Fear of punishment for incompetence
Fear of loss of personal identity
Fear of loss of group membership

(Graphic by author)

The second effort, prioritization, works hand-in-hand with higher headquarters buy-in and focuses limited resources. Squadrons must prioritize their resources based on a combination of their core mission, squadron vision, and higher headquarters priorities. Squadrons must always remember they are part of a hierarchal service. At the highest levels, the *USAF Strategic Master Plan* identifies "priority areas for investment, institutional change, and operational concepts."[27] Major commands leverage the master plan for their own priorities, which become more specific as they flow through numbered air forces, wings, and, hopefully, groups based on core missions and their vision for the future. The key is determining

how the squadron's mission and vision align with higher headquarters priorities. Once determined, priorities both focus resources and highlight a clear link between squadron efforts and group goals.

The third effort revolves around culture. A supportive command structure and clear priorities are meaningless unless squadron culture embraces innovation. After all, the Air Force has been on a wartime footing since 1991, charged with managing the conflicting pressures of drawdowns and mission creep. Turning away from the adaptation mindset this has fostered and embracing innovation requires more than setting new priorities and picking a tiger team. It requires a change in culture.

Simply put, culture is a system of shared beliefs on why things work and how problems should be solved.[28] It follows then, that changing culture means attacking problems differently. Organizations must change their focus from a reactive-adaptive approach into a proactive-innovative approach. For instance, squadrons need to ask if they are relying on a single shop or person to fix the problem, or if multiple resources can be brought to bear. Is the goal to accomplish the mission or to improve operational effectiveness? Is the plan to replace the old way of doing things right away or to test its effectiveness first? Equally important, who is asking these questions? The commander is an important part of the answer, but cannot be the only one. So how do squadrons start asking the right questions?

Leadership's Role in Cultural Change

More than any other member of an organization, leaders drive culture and, by extent, cultural change. Changing an organizational culture, however, is a complicated process. First, leaders must create an environment conducive to change. Then, they must forge new cultural norms through their action. Massachusetts Institute of Technology Professor Emeritus Edgar Schein explains this process through an organizational change model that focuses on the interaction between two types of anxiety: learning and survival. Learning anxiety is the fear that ties organizations to their old way of doing business (see table 2, page 5).[29]

Ideally, leadership lowers this fear by addressing concerns. Higher headquarters buy-in is key, guarding against fear of punishment for incompetence. At the same time, squadron leadership must increase survival anxiety, or as Schein puts it, "the horrible realization that in order to make it, you're going to have to change."[30] As dismal and authoritative as this sounds, increasing survival anxiety really comes down to exercising good leadership through the use of "embedding mechanisms" which are inextricably linked to the exercise of command (see table 3).[31]

As the sheer scope of embedding mechanisms demonstrates, changing culture is a complicated process that must be approached holistically. Despite the comfortable Air Force allusion, changing squadron culture is not the time to "wing it." Rather, it is a process that necessitates planning. How a squadron accomplishes this is a personal choice—the Air Force spends a lot of time and

Table 3. Leadership Embedding Mechanisms and Their Relationships

Embedding Mechanisms (Air Force Instruction 1-2, *Commander's Responsibilities*)	
What leaders pay attention to (Lead people-communication)	
How leaders react to crisis (Lead people-communication, discipline)	
How leaders allocate resources (Manage resources-all aspects)	
Deliberate role modeling, teaching, and coaching (Lead people-training, development)	
How leaders allocate rewards and status (Lead people-communication, manage resources)	
How leaders recruit, promote, and excommunicate (Lead people-communication)	
Immediate feedback based on adversary reaction	Feedback based on tests/evaluations against perceived threats

(Graphic by author)

Table 4. Two Planning Processes for Culture Change

Goldfein's Three-Element Approach
1. Put a single person in charge.
2. Develop a concept of operations.
3. Create milestones, objective, and performance measures.
Kotter's Eight-Step Approach
1. Establish a sense of urgency.
2. Create the guiding coalition.
3. Develop a vision and strategy.
4. Communicate the change vision.
5. Empower broad-based action.
6. Generate short-term wins.
7. Consolidate gains and produce more change.
8. Anchor new approaches in the culture

(Graphic by author)

effort teaching leaders how to lead. Whether one uses Goldfein's three-element approach, Harvard Business School Professor Emeritus John Kotter's Eight-Stage Process, or some other technique, leaders must take the time to develop a way forward (table 4).[32]

Whatever the process, changing culture must be deliberate. The move from an adaptive to an innovative squadron requires trust, both from the squadron and the higher headquarters. Within the squadron, leaders must calm the inevitable fear of change. From without, leaders have to demonstrate followership—higher headquarters need to know that squadron leadership is nested with their priorities. Higher headquarters must also demonstrate both faith in command and the moral courage to allow failure. Finally, innovation requires a clear vision forward. Leaders must describe where they are going—which is hard. Leading through adaptation, on the other hand, is easy. Survival anxiety comes naturally; one must adapt or fail. With pressures relegated to the future, innovation lacks clear and present survival pressure; however, this very lack is deceptive. The choice is really whether the Air Force and its sister services innovate for future success, or roll the dice on adaptation when the future comes due. ■

Notes

1. David L. Goldfein, "The Beating Heart of the Air Force … Squadrons!," CSAF [Chief of Staff of the Air Force] Focus Area paper (Washington, DC: CSAF, August 2016), accessed 16 August 2017, http://www.af.mil/Portals/1/documents/csaf/letters/CSAF_Focus_Area_Squadrons.pdf.

2. Deborah L. James and David L. Goldfein, "Reducing Additional Duties," Memorandum for All Airman, 18 August 2016, accessed 18 August 2017, http://www.af.mil/Portals/1/documents/SECAF/160816_Airmen%27s_Time_Memo.pdf?ver=2016-08-19-123457-897.

3. Goldfein, "The Beating Heart of the Air Force."

4. Ibid.

5. In this article, the concept of operational agility comes from the Air Force Future Operating Concept, where "operational agility is the ability to rapidly generate—and shift among—multiple solutions for a given challenge." U.S. Department of the Air Force, *Air Force Future Operating Concept: A View of the Air Force in 2035* (Washington, DC: U.S. Government Publishing Office [GPO], September 2015), 2, accessed 10 October 2017, http://www.ang.af.mil/Portals/77/documents/AFD-151207-019.pdf. This definition is also cited in Goldfein, "The Beating Heart of the Air Force."

6. Peter Senge, *The Fifth Discipline: The Art and Practice of the Learning Organization* (New York: Doubleday, 1990), 3.

7. Ibid.

8. Ibid.

9. Ibid., 12–14; Carl H. Builder, *The Masks of War: American Military Styles in Strategy and Analysis* (Baltimore: Johns Hopkins University Press, 1989), 38–39.

10. Senge, *The Fifth Discipline*, 13–14.

11. Ibid.; Robert T. Foley, "Dumb Donkeys or Cunning Foxes? Learning in the British and German Armies during the Great War," *International Affairs* 90, no. 2 (2014): 280.

12. Theo Farrell, "Improving in War: Military Adaptation and the British in Helmand Province, Afghanistan, 2006–2009," *Journal of Strategic Studies* 33, no. 4 (August 2010): 570.

13. In the context of this argument, military effectiveness applies primarily to effectiveness at the tactical level of operations. In limited cases, it may support the operational level, such as the ability of logistics to anticipate and support operational objectives. In this paper, the ability to support the operational level of war is evaluated primarily through the lens of tactical tasks. For a more in-depth look at the various aspects of military effectiveness, see Williamson Murray, *War, Strategy, and Military Effectiveness* (New York: Cambridge University Press, 2011).

14. U.S. Department of the Air Force, *Air Force Future Operating Concept*, 7.

15. Adam Grissom, "The Future of Military Innovation Studies," *The Journal of Strategic Studies* 29, no. 5 (October 2006): 907; see Foley, "Dumb Donkeys," for additional discussion of Grissom's analysis.

16. Ibid.

17. Correlli Barnett, *The Swordbearers: Studies in Supreme Command in the First World War* (London: Eyre & Spottiswoode 1963), 11.

18. Williamson Murray, "Innovation in the Interwar Years" (lecture, CGSC Art of War Scholars, Fort Leavenworth, KS, 25 January 2017).

19. Williamson Murray, *Military Adaptation in War: With Fear of Change* (New York: Cambridge University Press, 2011), 2–3, 309–10.

20. David L. Goldfein, "Remarks by General David Goldfein, Chief of Staff of the Air Force at the 2017 Air Warfare Symposium" (presentation, Air Warfare Symposium, Orlando, FL, 2 March 2017); Goldfein, "The Beating Heart of the Air Force"; James and Goldfein, "Reducing Additional Duties."

21. Air Force Instruction (AFI) 38-402, *Airmen Powered by Innovation* (Washington, DC: U.S. GPO, 5 February 2015), 11.

22. AFI 36-2406, *Officer and Enlisted Evaluation Systems* (Washington, DC: U.S. GPO, 8 November 2016), 24; Kyle Byard, Ben Malisow, and Martin E. B. France, "Toward a Superior Promotion System," *Air & Space Power Journal* (July-August 2012): 29, 32–33.

23. Amos Tversky and Daniel Kahneman, "Availability: A Heuristic for Judging Frequency and Probability," *Cognitive Psychology* 5 (1973): 209, 227–28

24. The Defense Officer Personnel Management Act (DOPMA) of 1980 mandates an up-or-out system of officer promotions within the military. For more information regarding DOPMA, see Bernard Rostker et al., *The Defense Officer Personnel Management Act of 1980: A Retrospective Assessment* (Santa Monica, CA: RAND Corporation, 1993), accessed 18 August 2017, http://www.rand.org/pubs/reports/R4246.html; R. Scott Adams and Micah W. Elggren, "Avoiding Halos and Horns: Cognitive Bias in Performance Reports," *The Reporter* 43, no. 2 (2016): 3.

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26. AFI 1-2, *Commander's Responsibilities* (Washington, DC: U.S. GPO, 8 May 2014), 2–3.

27. U.S. Department of the Air Force, USAF [U.S. Air Force] *Strategic Master Plan* (Washington, DC: U.S. GPO, May 2015), 3, accessed 18 August 2017, http://www.af.mil/Portals/1/documents/Force%20Management/Strategic_Master_Plan.pdf.

28. Edgar H. Schein, *The Jossey-Bass Business & Management Series: Organizational Culture and Leadership* (Hoboken, NJ: Jossey-Bass, 2010), 12, 18.

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31. Schein, *The Jossey-Bass*, 236; AFI 1-2, *Commander's Responsibilities*, 2–3.

32. Goldfein, "Remarks by General David Goldfein"; John P. Kotter, *Leading Change* (Boston, MA: Harvard Business School Press, 1996), 20–21.

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