

AU/ACSC/2014

AIR COMMAND AND STAFF COLLEGE

AIR UNIVERSITY

**BREAKING OUT OF TACTICS:
THE STRATEGIC VALUE MODEL AND THINKING CRITICALLY
AT THE OPERATIONAL LEVEL OF WAR**



Peter J. Schnobrich, Major, USAF

A Research Report Submitted to the Faculty

In Partial Fulfillment of the Graduation Requirements

Advisor(s): Col (Ret.) Richard M. Perry, USAF

Maxwell Air Force Base, Alabama

April 2014

Disclaimer

The views expressed in this academic research paper are those of the author and do not reflect the official policy or position of the US government or the Department of Defense. In accordance with Air Force Instruction 51-303, it is not copyrighted, but is the property of the United States government.

TABLE OF CONTENTS

	<i>Page</i>
DISCLAIMER	.ii
TABLE OF CONTENTS.....	.iii
ABSTRACT.....	iv
Introduction	1
Tactical Insularity	2
A side effect of centralized control	4
A Framework for Understanding Airpower Strategy	5
Strategy and Tactics.....	6
Means.....	8
Ways	10
Ends	11
The Strategic Value Model	12
Strategic Gain	13
Probability of Effect	16
Strategic Risk.....	17
Opportunity Cost	20
Relationship between factors.....	22
Conclusion	23
BIBLIOGRAPHY.....	27

ABSTRACT

Airpower is strategic, but does that mean Airmen are predisposed to interact with strategy? The physical domains in which the United States military projects power are separate and unique; Airmen and the air domain reflect these qualities. The air domain embraces the entire globe, and the ability of air forces to project power enables a near infinite list of military options to national leadership. These options can be strategic and they can be tactical; yet, Airmen are tactical by nature. Even though the target may be strategic, a B-2 crew which conducts a high-risk, high-value strike against enemy leadership is executing tactics, not strategy. These two disciplines, tactics and strategy, must meet somewhere. The operational level of war, which is described in joint doctrine as that which “links strategy and tactics”, is the place where Airmen bridge this gap. However, unlike its sister services which transition gradually from tactical to operational thought, the US Air Force inadvertently isolates Airmen from this process through one of its core tenets; centralized control. This paper explores both tactics and strategy in regard to the air domain. The strategic value model introduces an operational-level focused logic which incorporates risk, probability, and opportunity cost when considering military action, policy guidance, or readiness.

Introduction

General Dwight D. Eisenhower, Supreme Allied Commander of Europe and 34th President of the United States, never led troops in combat. During his time as an armor officer, he developed an understanding of tactics, but his technical expertise was never proven in combat. As Supreme Allied Commander of Europe, General Eisenhower commanded the Allied invasions of North Africa and Europe resulting in the defeat of the Third Reich. The idea that a military officer who has never seen combat can command the greatest military operation in the 20th century shatters many paradigms about the formula for a successful military officer. Why? Perhaps tactics and tactical expertise do not enjoy primacy in a military career such that the military prefers to believe. Air Force heritage, like all military heritage, celebrates tactical excellence: examples of this in the US Air Force are the Distinguished Flying Cross, the Mackay Trophy, and the USAF Weapons School.¹ Tactical expertise is perhaps the most emphasized trait for military professionals; yet for many Airmen, operational planning and strategy remain underdeveloped skills. This paper proposes that critical thinking at the tactical and operational level are distinctly different from one another, and outlines the strategic value model to provide a tool to assist the transition between the two.

The sections contained in this paper are specifically concerned about the transition Airmen make they shrug the primary responsibility of a specific weapons system, and assume the broader responsibility of managing defense resources to meet operational and strategic objectives. The US Air Force socializes the transition from thinking tactically to thinking operationally, and uses benchmarks such as intermediate professional military education (PME) as the standard transition point. The Air Command and Staff College (ACSC) endorses this approach on its website, stating “the program is designed to enable our students to evolve from

tactical experts in a particular career field into operational-level leaders.”² The vast expanse between strategy and tactics in modern warfare is what necessitates the operational level of war; as Joint Publication 1 states, “the operational level links strategy and tactics by establishing operational objectives needed to achieve the military end states and strategic objectives.”³ In order to think critically at the operational level, military professionals must understand the fundamentals of strategy. In order to advocate effectively for airpower, regardless of context, Airmen must understand the underlying principles of airpower strategy.

The following sections will specifically omit references to Airpower as US Air Force doctrine defines it. The reason for this is simple; it is less complex to address critical reasoning in regard to a single domain than attempt to do the same simultaneously across three. Focusing on the air domain also allows for greater continuity of theory, history and strategy. While this paper will use examples from the air domain, the argument can be made just as well using the electromagnetic spectrum (EMS) or the space domain. The following sections will break down critical reasoning at the operational level into three themes. First, tactics in the air domain create unique challenges to transitioning to the operational level. Second, airpower strategy will be defined followed by a discussion of ends, ways, and means as they pertain to a single domain. Finally, the strategic value model is proposed as a tool for critical thinking at the operational level.

Tactical Insularity

Airmen think tactically by nature; this is the product of years invested in developing individual technical skills that will be employed at the tactical level of war. Pilots are a classic example of this; two and a half years of training is a reasonable estimate of how long it will take a fighter pilot to become mission-qualified in an operational squadron from the first day of pilot

training.⁴ Electronic Warfare Officers (EWO) have a similar timeline; two years of training is the average to complete the training pipeline before a navigator/EWO is mission qualified.⁵ Given the investment of both time and resources, services generate maximum return on their investment by keeping aircrew operating their weapons system at the tactical level for longer periods of time. This investment strategy is excellent for building and maintaining tactical expertise, but it does come at a price. At some point, the Airmen who have developed as tactical experts must transition to the larger responsibility of using their knowledge and experience to solve operational or strategic problems. Solving problems at the operational level of war requires Airmen to think beyond tactics; Airmen must think operationally, rather than tactically, in order to link tactics to strategy.

Building tactical expertise involves developing problem solving skills that are transferrable to the operational and strategic level. However, tactical problems are different from operational and strategic problems and require a unique set of reasoning skills. Critical reasoning is essential to analytical practices such as the joint operational planning process (JOPP), and is also equally important to broader military advocacy. In services like the US Army and US Marine Corps, the linkage between tactics and operational planning mediums (i.e. JOPP) are continuous. The Army's military decision making process (MDMP) and the Marine Corps planning process (MCP) represent planning processes that have application from the lowest tactical level to higher operational levels.⁶ For Airmen, this continuum is replaced with centralized control. Centralized control, the first tenet of airpower, is critical to its employment. Centralized control allows a single Airman to maintain broad focus on the joint force commander's (JFC's) objectives, integrating air, space, and cyberspace assets across the full range of military operations.⁷ This allows Airmen to more effectively solve broader operational

and strategic problems, however centralized control also involves second order effects that must be considered when forging professional development.

A side effect of centralized control

Centralized control disconnects Airmen from strategy, reinforces a focus on tactical action, and discourages reasoning that link the two. As the organization that links theater strategy to air component tasks, an AOC identifies and delegates problems for Airmen to solve at the tactical level.⁸ While these tactical problems are challenging and require expertise to solve, the central command of an AOC effectually removes the notion of asking “why?” This is a vital feature of centralized control; air forces at the tactical level are employed in a manner that exploits the flexibility of airpower but sacrifices some direct investment in broader tactical and operational objectives. For example, a flight of F-15Es may be tasked to strike a command and control (C2) bunker in an adversary’s capital city, only to provide close air support (CAS) the following day to a mechanized infantry battalion. Both of these are very different tactical actions that likely serve different operational objectives, all of which nest together in a single theater campaign strategy. As far as air forces are concerned, they reach too far, reorient too quickly, and provide too much capability to be married to a single tactical or operational objective.

The air domain is a unique, which demands a unique approach to solving operational problems. Airpower has unique potential to be applied independent of other military power; examples of this is Operations Allied Force (1999) and Operation Odyssey Dawn (2011). Airpower also possesses even greater potential when integrated with other instruments of military power; examples of this include Operation Desert Storm (1991), Operation Enduring Freedom (2001), and emerging concepts such as Air-Sea Battle. In developing strategy, Airmen

must ensure they have a strong voice in linking ends, ways and means, particularly in regards to actions that exploit the air domain. Thinking beyond tactics, understanding strategy, and critically thinking at the operational level of war are the key to achieving this.

A framework for understanding airpower strategy

“It is paradoxical that air forces willing and able to expend billions of dollars on technical and tactical education typically devote a trivial amount to understanding what they do or might do strategically and why they are asked to do so by their political owners.”⁹

– Colin Gray, *Airpower for Strategic Effect*

The US Air Force needs airpower advocates, as does the US Army, US Navy and US Marine Corps. The US Air Force, much like its sister services, also need cyber and space power advocates. However, an airpower advocate is not inherently the same thing as a cyber or space power advocate. In truth, an advocate for “Airpower”, commonly referred to as “Big A” airpower, which includes air, space and cyberspace power, is a US Air Force advocate and is more inclined to represent the interests of the service rather than the overarching national interest of exploiting the air domain to achieve strategic objectives. This distinction is important, as advocating for the development of distinct service resources is far different than advocating for the prudent application of national defense resources. So what does it mean to be an airpower advocate, rather than an Air Force or specific weapons system advocate? This is one of the many questions that will be addressed below.

In order to discuss airpower strategy, airpower must first be defined in what it is and what it is not. Air Force Doctrine Document-1 defines Airpower as “the ability to project military power or influence through the control and exploitation of air, space, and cyberspace to achieve

strategic, operational, or tactical objectives.”¹⁰ USAF doctrine draws a distinction between its views and that of other services by staking a claim to “a broader focus on theater-wide and national-level objectives” while the other services primary “support their organic maneuver paradigms.”¹¹ This USAF centric view begs the question: *is it more beneficial to view airpower as a doctrinal-based service concept or as action exploiting a domain?* Joint doctrine defines the air domain as “the atmosphere, beginning at the Earth’s surface, extending to the altitude where its effects upon operations become negligible.” The distinction between these competing views is important in understanding the application of airpower, and is essential to the arguments contained within this paper. As such, the paper will adhere to Colin Gray’s adaptation to Billy Mitchell’s original definition, “airpower is the ability to do something strategically useful in the air.”¹²

Strategy and Tactics

The transition from thinking tactically to operationally requires an understanding of strategy and tactics. This is much easier said than done. The span of academia that debates what the term strategy means is staggering in its scope. To the military professional who shoulders some direct responsibility for the development and implementation of strategy, the utility of such exhaustive debate is limited beyond the halls of academic institutions. Ultimately, the military professional must settle on which definition or concept is most fitting. This section will aim to quickly, but not authoritatively, define airpower strategy. It will then seek to answer questions similar to those posed by A. T. Mahan in his 1890 work *Influence of Sea power*: What is the proper function of air forces; What is their true objective; What are the points upon which they should be concentrated; What is the military value of targeting industry, infrastructure, or leadership?¹³

The term strategy means different things to different people. Merriam Webster dictionary defines strategy as (1): the science and art of employing the political, economic, psychological, and military forces of a nation or group of nations to afford the maximum support to adopted policies in peace or war, (2): the science and art of military command exercised to meet the enemy in combat under advantageous conditions.¹⁴ In an instant, strategy is seen to exist at national, strategic and operational levels. This layered view of strategy is represented in Figure 1. Yet, as J. Boone Bartholomees, Jr. of the Strategic Studies Institute points out, “there is no consensus on the definition of strategy even in the national security arena.”¹⁵ For the purposes of providing a general framework for airpower advocacy, this paper will use an adaptation to the definition provided in joint doctrine: *Airpower strategy is a set of ideas for employing military power in the air domain in a synchronized and integrated fashion to achieve theater and multinational objectives.*¹⁶

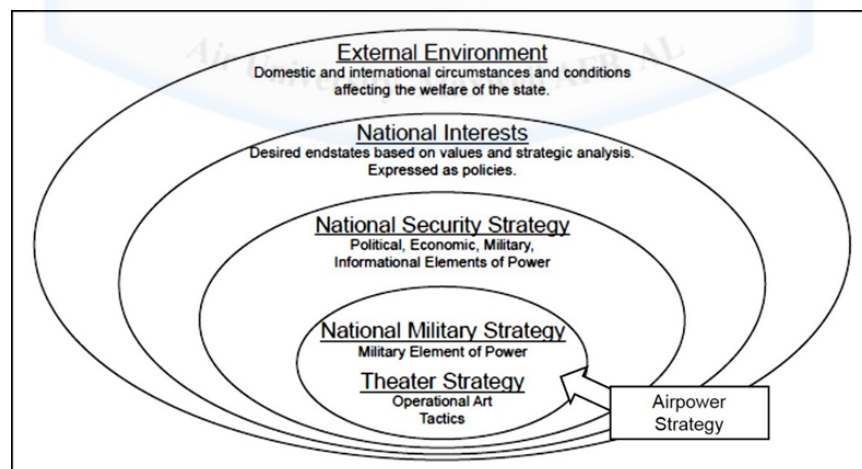


Figure 1: Comprehensiveness of Strategy¹⁷

In terms of military power, strategy can be summarized as linking ends, ways, and means. H. Richard Yarger expands this concept in his work *Toward a Theory of Strategy*: “Strategy is all about how (way or concept) leadership will use the power (means or resources) available to

the state to exercise control over sets of circumstances and geographic locations to achieve objectives (ends) that support state interests.”¹⁸ Airpower strategy is not unique. As a standalone concept, strategy is not complicated. Potential strategies, those proposed in theory and doctrine, and those intended to be applied to specific context are extremely complicated. To explore strategy, the remainder of this paper will accomplish two things. First, the general concept of strategy will be discussed. Second, strategic value will be explored from the perspective of an airpower strategist, and will provide historic examples of airpower to illustrate the concepts introduced.

Developing airpower strategy is a matter of determining the strategic value that can be derived through means and ways that are unique to the air domain. Understanding what these three terms mean, how they are distinct, and how they are related, is essential to understanding airpower strategy and advocating for its use.

Means

Means are the foundation of strategy and serve as the limiting factor of what can and cannot be done. Means are the specific resources which are available for use to accomplish objectives.¹⁹ Resources can be tangible or intangible, yet in the context of airpower, resources nearly always imply some form of technical capability that is employed in the air domain. Examples of airpower means include cargo aircraft such as the C-5 and C-17, stealth aircraft such as the B-2 and F-22, attack aircraft such as the A-10 and AC-130, and surveillance platforms such as the Persistent Threat Detection System (PTDS) aerostat and the RC-135 Rivet Joint. Means also include personnel, training programs, maintenance, and sustainment that are essential to exploiting the air domain. While a resource such as a B-2 uses the air domain as its

medium for transit and employment, no airpower resource derives its utility (power) solely through the air domain. Virtually all airpower means rely on terrestrial support for basing, maintenance and logistics as well as space-based support for navigation and communication. This is an important concept. When advocates talk to “airpower” capabilities, they must understand that no capability exists in isolation; viewing a capability holistically is critical to the accurate representation of military resources.

Means can also be a limiting factor in strategy, and the source of these limits can either be real (i.e. physical limitations) or artificial (i.e. doctrinal limitations). An AC-130 is a perfect platform to analyze from this perspective. The strengths of an AC-130 are readily apparent; long-loiter time, high-volume firepower, and pin-point accuracy. The limits to the gunship: ineffective versus certain hardened targets, vulnerable in daytime operations, and constrained maneuverability. Every weapons systems in service has a list such as this, real limits based on physical limitations of the platform. Means can also be artificially limited by doctrine and theory. The leading example of this in USAF history are long-range strategic bombers. Despite the success of Operation Cobra in World War II, where B-17s and B-24s blasted German troops in northern France, USAF doctrine still held that strategic bombers existed solely for strategic attack and nuclear deterrence.²⁰ Strategic attack is an essential function of a bomber force, however, doctrine can limit how military professionals view the use of a particular resource. While theory, doctrine and experience guides Airmen in determining how means can be employed, Airmen must be cautious as to not unintentionally permit doctrine to limit the way airpower is employed.

Ways

Ways are the essential link between a capability (means) and the desired effects which contribute to achieving national objectives. Ways are “how” objectives are to be accomplished through the employment of resources.²¹ It is impossible to consider ways without thinking of the resources (means) used and the objectives (ends) sought. AFDD 1 states that “Airpower is an inherently strategic force” and “can hold an enemy’s strategic centers of gravity... directly at risk”.²² This can be misinterpreted to signify that the “way” airpower should be best employed is at the strategic level to directly achieve strategic objectives. However, the value of airpower lies in its flexibility. The value of airpower does not lie in the fact that it can be applied directly at the strategic level, but rather that it can be employed in many ways across the spectrum of conflict, thus providing extensive options to national leadership.

Providing options can be seen by analyzing the ways the B-52, a long-range, heavy-bomber capable of employing a variety of conventional and nuclear weapons, has been used since it first became operational in 1955.²³ Since it became operational, the B-52 has been a steadfast leg of the nuclear triad. In 1972, B-52s provided conventional options for President Nixon to coerce the Vietnamese back into negotiations.²⁴ In 2001, B-52s conducted operations in support of US Special Forces in Afghanistan.²⁵ In early 2014, B-52 sorties off the Korean coast provided a show of force and a deterrent against North Korea aggression.²⁶ The ways the B-52 is used, whether designed to directly support strategic or tactical objectives, ultimately nests within an overall theater or military strategy. In the case of North Korea, the strategy of deterrence is directly supported at the strategic level by a B-52 sortie. In the case of OEF, the

strategy to enhance stability and defeat the insurgency is supported at the tactical level by B-52 missions. In these two cases the same capability, a long-range heavy-bomber, contributes at different levels to achieve national objectives (ends).

Ends

Ends are the overall products of tactical, operational, or strategic actions. Ends are “what” is to be accomplished, ultimately contributing to achieving a desired end state.²⁷ They can be considered as the product of the equation $Ends = Means \times Ways$. Unlike a typical mathematical equation where the product is calculated by multiplying the factors; in strategy *Ends* are defined first, and *Ways* and *Means* are subsequently solved to complete the equation. If the equation were inverted, it would indicate resource based strategy where the ends sought are merely a function of the ways and means available. Unfortunately, strategy is not a hard science, and seeking to balance this equation is far more complex than multiplication. Strategy is complex, but in its ideal form it should be linear; objectives (ends) are related as they move up the echelons of strategy. Tactical objectives are nested within and supporting to operational objectives; and operational objectives support to strategic objectives. Ultimately strategic objectives should nest within grand strategy. Airmen must understand that airpower, like all combat power, is about linking specific actions at the tactical/operational/strategic level of war to overall national level objectives. Quantifying the contributions of these actions is challenging. Even more so is predicting the contributions of specific actions to strategic objectives, thus is critical reasoning at the operational level of war.

The Strategic Value Model

Strategy, to include airpower strategy, aims to produce or contribute to a desired end state; this concept implies action that has strategic value. *Strategic value* (S_V) is the estimated utility of a given action, policy, or resource will have when it applied within specific context to meet strategic objectives, either directly and indirectly. If an action, or series of actions, is taken which is detrimental to achieving the desired end state, it has negative strategic value. If no action is taken, or an action is taken with has no effect on strategic objectives, there is zero strategic value. If an action is productive towards achieving the desired end state, it has positive strategic value. Assuming the end state has been generally defined, four questions help to set a course towards linking ends, ways and means to produce positive strategic value: 1) What can be gained strategically through a given tactical action, 2) What is the probability of attaining the desired strategic effect, 3) What are the strategic risks, 4) What options are available to accomplish the same strategic objectives? The equation in Figure 2 offers a mathematical representation of this logic.

$$(S_G \times P_E) - R - O_C = S_V$$

S_G = strategic gain
 P_E = probability of effect
 R = risk
 O_C = opportunity cost
 S_V = strategic value

Figure 2. Strategic Value Model

The equation appears mathematical, but it is a model to assist in critical reasoning when linking strategy to tactics. Naval theorist Admiral J.C. Wylie produced a similar mathematical formula for calculating risk and warned about treating such logic as arithmetic, “to insure success in its use, there is only one condition that must be met: the factors involved must never be expressed in arithmetic quantities. That would blunt the fine edge of judgment and obscure the true balance of intangibles.”²⁸ The intent of describing the concept in mathematical terms is to emphasize that all factors, those described in detail below, must be analyzed and factored in.

Strategic Gain

Strategic gain (S_G) is the specific effect an action or series of actions has on strategic objectives. Since a single action can have many consequences, this is the sum of both positive and negative consequences (i.e. direct and indirect effects).²⁹ Strategic gain is distinctly separate from direct tactical gain. If an action has a tactical gain, and the tactical objective it supports is properly nested within overall strategic objectives, then that action has some level of strategic value. Objectives should be designed to achieve positive strategic effect, regardless of the level. The implied tactical tasks of gaining and maintaining air superiority is a classic airpower example of this. In the Six Days War, the Israeli Air Force (IAF) targeted Arab airfields in Egypt, Syria, and Jordan.³⁰ The tactical objectives of destroying Arab aircraft on the ground contributed to the operational objective of establishing air superiority. This primary military objective contributed directly to other operational objectives and the overall strategic objectives of defeating Arab military forces and the conquest of the Sinai Peninsula, the Golan Heights and the West Bank.³¹

When developing strategy, a constant challenge for operational planners is that the tactical or operational gain of some actions will be more readily apparent than it will be apparent through others. However, obvious tactical or operational value does not necessarily equal a high level of strategic value. This challenge is seen in the friction surrounding apportionment decisions during operational planning. To the US Army, close air support (CAS) has a very real and tangible effect. If an attack aircraft can destroy an enemy tank, the direct tactical effect is one less T-72 which can threaten ground forces. Airmen also make efforts to quantify tactical gain scientifically. Through operational testing it is possible to calculate an accurate probability of damage, thus providing very exact estimates of what a single weapon can do on the battlefield given specific delivery parameters, target type, weather, and impact conditions. The tactical effects in the air domain, particularly action taken directly against other fielded forces, are far easier to quantify. Clausewitz stated this clearly when he wrote “In a tactical situation one is able to see at least half the problem with the naked eye, whereas in strategy everything has to be guessed at and presumed.”³²

Strategic attack, historically, has been far more controversial than the use of aircraft to conduct counter air or counter land operations. It can be argued that strategic attack has less appeal to military professionals, not because it does not possess value, but because those effects are not readily obvious. Since the Combined Bomber Offensive in World War II, attacking an enemy’s vital centers has been exhaustively examined by military professionals and academics alike.³³ Much of the debate has centered on whether airpower has been decisive. This debate, and the statement made in support of it by Billy Mitchell, cloud the more critical question of what strategic effects can airpower achieve. From a warfighter’s perspective, it is far more appealing to use a resource in a manner that has a readily tangible and measurable effect.

The two wars fought in Iraq in 1991 and 2003 provide contrasting examples of the strategic gain accomplished by strategic attack missions into the heart of Baghdad. In Operation Desert Storm, the Instant Thunder air campaign designed to strike directly at the regime failed to kill the most senior leadership. However, the targeting of command and control facilities, and Iraqi power distribution infrastructure significantly hindered the ability of senior leadership to monitor or control operational units.³⁴ This operational paralysis created a distinct asymmetric advantage for coalition forces as they pushed into Iraq. In Operation Iraqi Freedom, 12 years later, many of the same target analysis was done on the command and control, as well as Iraqi leadership. The results of the strategic arm of the OIF air campaign did not enjoy the same success as it did in 2003.³⁵ A primary reason for this was Iraqi leadership adapting to the way the USAF targeted. This reduced much of the strategic gain that had been achieved in similar ways over a decade earlier. However, the years of Operation Southern and Northern Watch had a significant impact on Iraqi defenses as well as their command and control.³⁶ In the months leading up to OIF, air forces increased the pressure on Iraq by further shaping the environment. Given these conditions at the start of OIF, the strategic gain that was available through strategic attack missions at the outset was less than was available in other mission areas.

Strategic gain is contextual. During Desert Storm, many targets in the first days were focused on leadership, infrastructure and system essentials. As this was the first time Iraq had encountered the US military in combat, many of these targets were vulnerable to precision strikes by stealth aircraft. The situation during Iraqi Freedom, from the ground force build up to the air strikes in the year prior to the ground offensive, was far different. This is also reflected in the apportionment decisions of airpower in the first 10 days of the war. After three days of heavy preplanned strikes against fixed targets, the air plan shifted to a greater number of on-call

missions, many of which supported ground forces.³⁷ This shift in focus was the byproduct of balancing operational objectives. By the 4th of April, 85% of coalition air apportionment was directed toward the ground effort, resulting in substantial attrition of Iraqi divisions.³⁸ This enabled the rapid push by coalition forces to surround and capture Baghdad. The strategic gain of interdiction and coalition air missions is apparent, but cannot be used as an example that air forces inherently have more to gain strategically in one mission over another. The circumstances at the outset of OIF, to include a small ground force with two divisions and air superiority practically established, shifted the operational priorities. This is directly related to where and how airpower strategy is formulated to maximize strategic gain.

Probability of Effect

Probability of effect (P_E) is a measure of how likely the action will succeed in attaining the desired effect. This is a function of both the probability of tactical success (i.e. successfully targeting what is intended), and the probability of the desired effect (i.e. the system reacts in the manner desired). Probability of tactical success is a function of all aspects of a mission that contribute to the application of power, which can include anything from humanitarian assistance to precision strike. The factors that influence tactical success are familiar to any Airman who has engaged at the tactical level: accuracy of intelligence, weather, aircrew proficiency, weapon system capability, etc. Probability of desired effect is a function of what happens after power is successfully applied. This assumes tactical success, and analyzes the possible system reactions to the application of force. An example of P_E , the failed decapitation strike on Saddam Hussein at Dora Farms, helps illuminate this concept.

On March 19, 2003 the CIA informed the President they had located Saddam Hussein and his sons with a high degree of certainty.³⁹ National leadership estimated that Iraq would capitulate if Saddam were forcibly removed. This equates to the identified strategic gain of a decapitation strike by USAF F-117s. The probability of tactical success in the Dora Farms strike was a function of the accuracy of CIA intelligence, the ability of the F-117s to successfully navigate through Iraqi defenses to the target, the ability of the aircrew accurately guide the weapons to the target, and the ability of the weapons to function as planned. The probability of desired effect was more abstract. Coalition leadership assumed that “cutting the head off the snake” would result in capitulation, or perhaps some type of cooperative negotiation. This probability was a function of who would know if Saddam was dead, who would assume command, what was the remaining power balance within the government, and how would the Iraqi population respond to the news? Unfortunately, the mission was a tactical failure in the sense that the target, Saddam Hussein, was not at the compound and survived the attack by a wide margin.⁴⁰ The probability of desired effect of a decapitating strike in Iraq never played out.

Strategic Risk

Risk is inherent in all operations, and an essential component of thinking operationally is to consider risk beyond the tactical level. *Risk (R)* is defined in joint doctrine as “the probability and severity of loss linked to hazards”.⁴¹ In military operations, the most common risk is that due to tactical hazards in the battle space. Much of this risk at the tactical level is directly related to probability of effect (P_E), making the two factors not perfectly exclusive. Beyond tactical application, risk also includes many other types such as political, diplomatic and economic risk. These forms of risk are more akin to strategic risk. Of note, joint doctrine focuses on the direct

risk to military operations due to shortfalls in resources or in execution, leaving the analysis of the strategic risk imposed by military actions out of the joint planning process.⁴²

In his paper on managing strategic risk, James Holcomb defines it as “the probability of failure in achieving a strategic objective at an acceptable cost.”⁴³ Executing a strategy implies an interaction with an object that reacts, and reacts unpredictably.⁴⁴ The interaction of complex systems, which is essentially what conflict boils down to, can make it very difficult to predict outcomes. This is even more troublesome in advance, when conducting operational planning and attempting to make sound predictions from a distance before ever interacting with the system. This is a disadvantageous position to be in for the military planner as the only way to truly understand and accurately predict a complex system is to interact with it. This challenge is intensified for Airmen who look to employ ways and means to pursue objectives at all levels of warfare simultaneously.

Identifying strategic risk does not imply a specific decision should be taken, it serves to provide well-informed military options to senior leaders. An example of strategic risk that was identified and then accepted came in the months leading up to the D-Day invasion after General Dwight Eisenhower took control of US Strategic Air Forces and the RAF Bomber Command. Eisenhower’s priority was to disrupt German supply lines in preparation for the Allied invasion of France. Instead of striking Germany these attacks were to target French infrastructure that was being used by the Third Reich. Due to the accuracy of bombing technology at the time and from the results seen throughout the combined bomber offensive (CBO), it was apparent to Allied leaders that many French civilians would be killed in the attacks.⁴⁵ This strategic risk, Allied attacks directly causing civilian casualties to an Allied nation, was the result of tactical action proposed by Eisenhower’s staff. This risk was elevated to Roosevelt and Churchill, who

ultimately gave the go ahead. The result was approximately 4,750 French civilians killed prior to D-Day, as well as an effective interdiction campaign that helped enable the successful Allied invasion of Europe.⁴⁶ While there is no way to control strategic risk, analyzing it can improve military options brought forward for a decision.

Strategic risk, either when it is not identified or is not accurately reflected in military options, will result in real and potentially long-term effects on military operations. During the initial stages of the 2003 invasion of Iraq, the “Shock and Awe” air campaign was designed to create similar operational paralysis to that which occurred in the first Gulf War. This involved directly striking strategic targets and the system essentials which supported Iraqi senior leadership. From the Iraqi perspective, overwhelming defeat in 1991 led Saddam and his regime to alter its headquarters and communications structure to be more survivable against the precision of US airpower.⁴⁷ This led to reduced effectiveness of Coalition strikes against Iraqi leadership, communications, and command and control. Even though the attacks were less effective than planned, the strikes were still highly destructive to existing Iraqi infrastructure. The invasion was successful, yet the damage was very slow to repair, significantly hindering Coalition reconstruction efforts.⁴⁸ The difference between the 1991 and 2003 wars against Iraq are significant, not least of all being the different strategic outcomes. In 1991, the survival of Iraqi national infrastructure was not a strategic concern of the Coalition, and carried little strategic risk. In 2003, the objective of toppling Saddam’s regime required that the Coalition would play a significant role in establishing a functioning government. A major requirement of this was functional infrastructure, and any destruction to that carried strategic risk. At the operational level, assessing strategic value requires extensive risk analysis at all levels, and

requires quantifying potential strategic risk. This is essential to ensure that actions taken at the tactical level have been thoroughly evaluated regarding their potential strategic affect.

Opportunity Cost

Opportunity cost (O_C), albeit a term of economic theory, is broadly applicable to strategy and is an essential component of advocacy. Opportunity cost is “the value of the next-highest-valued alternative use of that resource.”⁴⁹ This addresses the essential question, what else could I be doing with this resource? In some instances, the best alternative is to do nothing. Analyzing alternatives requires the same considerations of probability and risk as described above. Every alternative has some level of strategic gain, a probability of achieving that gain, and associated strategic risk. This is represented by the equation: $O_C = (S_G \times P_E) - R$. The purpose is to ensure that the opportunity cost of taking a certain action does not exceed the intrinsic value of that specific action; put more plainly, the selected action is profitable.

In regard to airpower strategy, opportunity cost is central to apportionment. Recommending air apportionment priorities is an essential responsibility of the air component commander.⁵⁰ Like all military resources, airpower assets are finite. In many cases, the demand of air assets will exceed supply. Excess demand can exist in capacity (i.e. more missions than aircraft can fly) or capability (i.e. mission requirements exceed the tactical or technical capability of weapons system). Due to the inherent flexibility of airpower, developing airpower strategy is about choice; it is also about providing a wide range of options. Airpower strategy is about choosing when and where you apply airpower in a manner that provides the greatest strategic benefit toward achieving national objectives.

An early example of airpower apportionment came in 1944. In preparation for Operation Overlord, General Eisenhower took operational control of the US Strategic Air Forces, the forces which had been dedicated to strategic bombing of the combined bomber offensive (CBO). During the five months Eisenhower held command, he “apportioned” heavy and medium bombers to an interdiction role, aiming to disrupt transportation routes and choke points that would hinder the German mobilization efforts to defend against the Allied assault of Normandy.⁵¹ During this time General Spaatz, commander of USSTAF, continued to advocate for a shift in apportionment of long-range bombers back to strategic targets. Spaatz argued that the greatest support that USSTAF could provide was by destroying German oil production, and the opportunity cost of dedicating bombers to an interdiction role was too high. Ultimately, Eisenhower conceded and allowed the bombers to conduct limited operations against synthetic oil production. The pinnacle of this campaign was May 12th, a day which the Nazi Minister of Armaments would later declare as the “end of German armaments production”, where the attacks resulted in the destruction of 90% of German aviation fuel production.⁵² Eisenhower still retained direct control, and many senior Airmen were still disgusted by the diversion from the principles of AWPD-1 and 42 even in light of the compromise struck between Eisenhower and Spaatz. Despite this, success in the weeks following the D-day invasion, particularly the massive bombing efforts of tactical and strategic forces to assist the breakout at Saint-Lo, known as Operation Cobra, vindicated advocates of the utility of airpower in support of ground forces.⁵³ The back and forth between Eisenhower and Spaatz is a classic example of apportionment, and how airpower is a finite resource that cannot be used everywhere at once.

Relationships between the factors

The relationships between the factors in the equation are equally as important as the factors themselves. Strategic gain has less strategic value if the probability of the desired effect is extremely low. Strategic gain may be diminished if the action carries an immense amount of strategic risk. Taking a specific action does not make sense if greater effect can be achieved by an alternative use. It can be implied that maximizing strategic value is merely analyzing options in effort to identify that which maximizes strategic gain, maximizes probability of effect, and minimizes risk; the sum of which is of greater value than the next best alternative. It is prudent for military professionals to fully grasp that it is in our adversary's best interest to minimize the probability of effect, and maximize the risk of any action taken.

For military professionals who find utility in this model, there are several additional considerations which will be mentioned here only briefly. First, any assessment of the three main factors (strategic gain, probability of effect, and risk) must be collaborative (i.e. joint, coalition, interagency) to be accurate. All actions included in a particular strategy contains risk, some of which will only be raised through the unique perspective of another component or another nation. Second, the process is complicated and requires time. Extensive research and analysis of systems is required for adequate enough understanding that allows for accurate estimates of strategic gain or probability of effect. Department of Defense agencies such as the Joint Warfare Analysis Center (JWAC) specialize in analysis such as this, and can take 6 month to produce a reasonable estimate.⁵⁴ Finally, even the most complete research and analysis will produce estimates with imperfections. This can be due to gaps in intelligence, poorly constructed assumptions, or flaws during analysis. Ultimately, the only way to determine how a complex system will react is to interact with it.

The definitions above provide a conceptual understanding of the strategic value model. Strategic gain is a function of both actors in a conflict. If a nation is asymmetrically strong in one area, its enemy will pursue a strategy that mitigates that advantage. Strategic gain is not limited to the ways or means that are used. The prudent use of military technology may have the greatest effect on diplomacy, or perhaps economics. In addition, strategic risk is not merely a function of adversary capability or environmental risk. Risk may be a direct function of other components of strategy; one action may expose an operation to risk, while another aims to mitigate that risk. Altogether, the foundation of the strategic value model is to maximize strategic gain, maximize the probability of effect, and minimize risk.

Conclusion

Tactics are the foundation of any military profession. Tactical expertise produces superior tactical action. Superior tactical action provides asymmetric advantage to any modern military. However, tactics that are not guided by strategy or are not linked to strategic objectives, are a waste of resources. In order for Airmen to participate in operational planning, whether as a member of the air component, a joint task force, or a combatant command, they must understand both tactics and strategy.

Not only must Airmen at the operational level understand tactics and strategy, they must be able to apply that expertise in a manner that links ends, ways, and means. The strategic value model is intended to do that. Analyzing strategic value is essential to responsible use of resources, regardless of whether the decision is regarding target selection, apportionment, or establishing directives. The essential questions that must be asked are: what is the strategic gain of this action, policy, or resource? What is the probability that this will achieve strategic effect,

both the probability of tactical success and the probability of desired effect? What strategic risk does this action, policy, or resource impose to the United States and its allies? Finally, and perhaps most importantly, is this action, policy, or resource the most valuable option available? Is greater strategic value available by doing something else?

While tactical expertise is and should remain a top priority in professional development, the US Air Force must build Airmen skilled in operational planning and strategy. Critical thinking at the tactical and operational level are distinctly different from one another, and they should be treated as separate, yet related, professional development objectives. The strategic value model introduced here is one tool that may prove valuable in assisting Airmen in breaking out of tactics.



1. *The Distinguished Flying Cross* is awarded to any officer or enlisted person of the Armed Forces of the United States who shall have distinguished her/himself in actual combat in support of operations by heroism or extraordinary achievement while participating in an aerial flight. *The Mackay Trophy* is given for the "most meritorious flight of the year" by an Air Force person, persons, or organization (first consideration given to individuals) for gallantry and intrepidity; and for unusual initiative and resourcefulness and achievement of outstanding results with unusual presence of mind under combat or non-combat conditions. *The US Air Force Weapons School* trains tactical experts and leaders of Airmen skilled in the art of integrated battle-space dominance across the land, air, space and cyber domains.

2. Air Command and Staff College official website.

3. JP 1, I-8.

4. Interview with multiple fighter pilots at Air Command and Staff College, 2013-2014.
(unattributed interview)

5. Major David Donatelli (B-52 Electronic Warfare Officer), interview by the author, 5 April 2014.

6. Reference US Army Military Decision Making Process and Marine Corps Warfighting Publication (MCWP) 5-1, Marine Corps Planning Process.

7. AFDD-1, *Air Force Basic Doctrine*, 59.

8. JP 3-30; xi, II-8, II-14.

9. Gray, *Airpower for Strategic Effect*, 27.

10. AFDD-1, *Air Force Basic Doctrine*, 24.

11. Ibid.

12. Gray, *Airpower for Strategic Effect*, 9.

13. Mahan, *The Influence of Sea Power upon History: 1660-1783*, 7.

14. Merriam-Webster online.

15. Bartholomees, "A Survey of the Theory of Strategy", 13.

16. Joint Publication 1, I-7, defines strategy as: "a prudent idea or set of ideas for employing the instruments of national power in a synchronized and integrated fashion to achieve theater and multinational objectives."

17. Yarger, "Toward a Theory of Strategy: Art Lykke and the Army War College Strategy Model", 45. This figure was modified from the original to indicate where *Airpower Strategy* fits into the overall hierarchy of strategy.

18. Ibid., 45.

19. Ibid., 49.

20. A prime example of this was Strategic Air Command's attitude toward the deployment of B-52s to Vietnam during the late 1960s; see Michel, *11 Days of Christmas: America's last Vietnam battle*, 1-4.

21. Yarger, "Toward a Theory of Strategy", 49.

22. AFDD 1, *Air Force Basic Doctrine*, 33.

23. www.af.mil, B-52 fact sheet.

24. Michel, *11 Days of Christmas: America's last Vietnam battle*, 53-56.

25. Lambeth, "Operation Enduring Freedom, 2001", 259.

-
26. Reuters. "North Korea says B-52 run imperils family reunions".
<http://www.reuters.com/article/2014/02/06/us-korea-north-idUSBREA150A320140206>
27. Ibid., 49.
28. J.C. Wylie, "The Calculation of Risk," United States Naval Institute Proceedings, July 1953, p. 725.
29. JP 5-0, III-21.
30. Gordon, "Air Superiority in the Israeli-Arab Wars, 1967-1982", 133.
31. Pollack, 489.
32. Clausewitz, *On War*, 178-179.
33. Some of the academic works reviewed for this paper that reflect this statement include: Clodfelter, Mark, *Beneficial Bombing*; Davis-Biddle, Tami, *Rhetoric and Reality in Air Warfare*; Pape, Robert A., *Bombing to Win*; Smith, Rubert, *The Utility of Force*.
34. Olsen, 177.
35. Murray, "Operation Iraqi Freedom, 2003", 288.
36. Murray, *The Iraq War*, 162-163.
37. Ibid., 170.
38. Ibid., 174.
39. Ibid., 155.
40. Gordon and Trainor, *Cobra II*, 177.
41. JP 1-02, 229.
42. Joint Publication 5, *Joint Planning*, I-2. "In the course of developing multiple options to meet the strategic end state, JFCs and their planning staffs, as well as the larger JPEC, identify and communicate shortfalls in DOD's ability to resource, execute, and sustain the military operations contained in the plan as well as the necessary actions to reduce, control, or accept risk with knowledge of potential consequences." JP 5, p. I-2.
43. Holcomb, "Managing Strategic Risk", 67.
44. Ibid, 68.
45. Clodfelter, *Beneficial Bombing*, 161-162.
46. Ibid., 161.
47. Murray, "Operation Iraqi Freedom, 2003", 288.
48. Ibid., 289.
49. The Concise Encyclopedia of Economics, s.v. "Opportunity Cost" (by David R. Henderson), <http://www.econlib.org/library/Enc/OpportunityCost.html/> (access 12 February 2014).
50. JP 3-30, II-2.
51. Clodfelter, *Beneficial Bombing*, 161.
52. Ibid., 165.
53. Ibid., 163.
54. Joint Warfare Analysis Center, briefing, 11 Apr 2014.

BIBLIOGRAPHY

- Air Command and Staff College. "About ACSC." Air University, retrieved 24 February 2014. <http://www.au.af.mil/au/acsc/aboutACSC.asp>.
- Air Force Doctrine Document (AFDD) 1. *Air Force Basic Doctrine*, 14 October 2011.
- Bartholomees, J. Boone. "A Survey of the Theory of Startegy." In *The U.S. Army Guide to National Security Issues, Volume 1: Theory of War and Strategy*, edited by J. Boones Bartholomees, Jr., 3-12. Carlisle Barracks, PA: Strategic Studies Institute, July 2010.
- Clausewitz, Carl von. *On War*. Edited and translated by Michael Howard and Peter Paret. Princeton, NJ [or N.J.]: Princeton University Press, 1976.
- Clodfelter, Mark. *Beneficial Bombing: The progressive foundations of American air power, 1917-1945*. University of Nebraska Press: Lincoln, NE. January 2011.
- Gordon, Shmuel L. "Air Superiority in the Israeli-Arab Wars, 1967-1982", In *A History of Air Warfare*, edited by John A. Olsen, Dulles, VA: Potomac Books Inc., January 2010.
- Gray, Colin S. *Airpower for Strategic Effect*. Maxwell AFB, AL: Air University Press, February 2012.
- Henderson, David R. "Opportunity Cost." *The Concise Encyclopedia of Economics*, <http://www.econlib.org/library/Enc/OpportunityCost.html>.
- Holcomb, James F. "Managing Strategic Risk." In *The U.S. Army Guide to National Security Issues, Volume 1: Theory of War and Strategy*, edited by J. Boones Bartholomees, Jr., 67-78. Carlisle Barracks, PA: Strategic Studies Institute, July 2010.
- Jablonsky, David. "Why is Strategy Difficult." In *The U.S. Army Guide to National Security Issues, Volume 1: Theory of War and Strategy*, edited by J. Boones Bartholomees, Jr., 3-12. Carlisle Barracks, PA: Strategic Studies Institute, July 2010.
- Joint Publication (JP) 1. *Doctrine for the Armed Forces of the United States*, 25 March 2013.
- Joint Publication (JP) 1-02. *Department of Defense Dictionary of Military and Associated Terms*, 8 November 2010 (As Amended Through 15 March 2014).
- Joint Publication (JP) 3-30. *Command and Control of joint Air Operations*, 10 February 2014.
- Joint Publication (JP) 5. *Joint Operation Planning*, 11 August 2011.
- Mahan, Alfred T. *The Influence of Sea Power upon History: 1660-1783*. New York, NY: Hill and Wang Publishing. 1957.
- Merriam Webster Online Dictionary. Accessed 15 March 2014. <http://www.merriam-webster.com/>.
- Michel, Marshall L. *11 Days of Christmas: America's Last Vietnam Battle*. New York: Encounter Books, December 2001.
- Murray, Williamson. "Operation Iraqi Freedom, 2003." In *A History of Air Warfare*, edited by John A. Olsen, Dulles, VA: Potomac Books Inc., January 2010.

Murray, Williamson and Scales, Robert H. *The Iraq War: A Military History*. Cambridge, MA: Belknap Press, October 2005.

Reuters. "North Korea says B-52 run imperils family reunions." *Reuters News*, 6 February 2014. <http://www.reuters.com/article/2014/02/06/us-korea-north-idUSBREA150A320140206>.

Yarger, Richard A. "Toward a Theory of Strategy: Art Lykke and the Army War College Strategy Model." In *The U.S. Army Guide to National Security Issues, Volume 1: Theory of War and Strategy*, edited by J. Boones Bartholomees, Jr., 45-52. Carlisle Barracks, PA: Strategic Studies Institute, July 2010.

Wylie, J.C. In "The Calculation of Risk". *United States Naval Institute Proceedings* (July 1953): p. 725. In Holcomb, James H. "Managing Strategic Risk" In *The U.S. Army Guide to National Security Issues, Volume 1: Theory of War and Strategy*, edited by J. Boones Bartholomees, Jr., 67-78. Carlisle Barracks, PA: Strategic Studies Institute, July 2010.

