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14. ABSTRACT The tangled web of confusion surrounding the Center of Gravity (COG) has morphed this war fighting concept into something that is so abstract, so confusing and so hard to form a consensus on, that the true meaning of its original context has been construed. Each service has a slightly different definition of a COG and Joint Publications offer another. During planning, component commanders and staffs will [rarely] agree on what to call the COG. In fact, Air centric forces will define one aspect as the COG while ground and naval forces will define another. If the COG framework that is currently utilized so ambiguous, so different, and often misunderstood; it may be time to take a critical look at what the Center of Gravity really is and at what level of warfare it really exists.					
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The Center of Confusion: “Otherwise known as the Center of Gravity”

by

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Major USMC

A paper submitted to the Faculty of the Naval War College in partial satisfaction of the requirements of the Joint Military Operations Department.

The contents of this paper reflect my own personal views and are not necessarily endorsed by the Naval War College or the Department of the Navy.

Signature: _____

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Introduction

The tangled web of confusion surrounding the Center of Gravity (COG) has morphed this war fighting concept into something that is so abstract, so confusing and so hard to form a consensus on, that the true meaning of its original context has been construed. Each service has a slightly different definition of a COG and Joint Publications offer another. During planning, component commanders and staffs will [rarely] agree on what to call the COG. In fact, air centric forces will define one aspect as the COG while ground and naval forces will define another. If the COG framework that is currently utilized is so ambiguous, so different, and so often misunderstood; it may be time to take a critical look at what a Center of Gravity really is and at what level of warfare it really exists.

This paper will contradict the current perspective of viewing a (COG) in two ways. First, it will challenge the current tri tiered approach of trying to assess a COG at all three levels of war. Instead, a perspective is pursued that views an adversary holistically¹ with the COG being that one focal point of balance that ties together all aspects of national power projection capability. Secondly, this paper views the COG not necessarily as a strength, but as a singular focal point of balance that normally resides at the strategic level of war and is the element that holds all other entities together.

When a holistic perspective is utilized, it becomes apparent that the operational and tactical levels of war do have critical elements embedded in them. However, they cannot be called COGs because they are not crucial for the holistic functioning of an enemy's means to fight, nor are they the singular focal point which all other systems support. An analysis of several past conflicts found that the true center of gravity did reside at the highest levels, and that actions at the operational and tactical level were

¹ This author uses the term "Holistically" to describe the enemy as a singular whole.

closer akin to critical requirements and capabilities rather than a COG. While critical elements at the lower levels of warfare can and often do influence the destruction of a strategic COG, they are not COGs in and of themselves because they are not focal points for the entire system.

When a COG is sought, it is imperative that the enemy be viewed holistically vice individual entities equaling a greater sum. True, warfare has three levels, but the COG should not and must not be viewed in this same manner. The cumulative building effect of attacking a tactical and operational critical element or (COG as it is currently called) does not necessarily lead to the strategic COG being thrown off balance. A retrospective view of Carl Von Clausewitz may best facilitate an understanding as to why the COG should be viewed, not as a tri tiered entity, but as a singular focal point in a holistic enemy system.

The Center of Confusion: How it all began.

The COG concept for military affairs was first discussed in detail by the German military officer and author Carl Von Clauswitz. However, the consensus on this theory has been aggressively debated. Much of this debate derives from an understanding of what Clauswitz was really trying to say in his COG concept. Since the original work was written in German, some feel the true meaning of his theory was not conveyed correctly in translation. Adding to possible translation misinterpretations, additional confusion of the true meaning rests in the fact that Clauswitz died before his work was complete. Clausewitz's ideas, as they are known today, were completed by his wife based on her interpretation of her husband's notes.

Today's View of a Center of Gravity (Counter Argument)

Joint military publications today define a COG as:

*Those characteristics, capabilities or sources of power from which a military force derives its freedom of action, physical strength, or will to fight.*²

Because of this definition, modern day theorists such as Dr. Milan Vego³ and Dr. Joe Strange⁴ argue that the COG is a source of strength. If taken away, the enemy who owns the source of strength will be defeated. Theorist such as Vego and Strange also argue that a COG exists at the strategic, operational and tactical level of warfare and because of this each layer builds upon the other ultimately impacting the COG at the strategic level of war. Additionally, some planners will argue that multiple COGs exist for each of the three levels of war⁵. What is missing in this current approach to COG analysis is the act of stepping back and visualizing the whole picture in context. A closer examination of the COG concept brings about some interesting conclusions and questions about the accuracy of the current COG understanding and applications. To better illustrate this point, a look at physics offers some benefit to understanding how a holistic view with a singular focal point of balance works. Since Clausewitz derived some of his principles from physics, a review of physics will better frame the context in which he articulated his COG ideas.

Singular focal point: Physics and the Center of Gravity

In physics, the definition for a COG is a collection of masses at a point where all the weight of the objects can be considered concentrated. In problems involving extended bodies and gravity, one can impose the equilibrium condition by assuming

² *Joint Publication 3-0*, Doctrine for Joint Operations, 10 September 2001, P. GL-5

³ Dr Milan Vego states on P. 309 of his book *Operational Warfare*, that a COG is that source of massed strength-physical or moral, or a source of leverage-whose serious degradation, dislocation, neutralization or destruction would have the most decisive impact on the enemy's or one's own ability to accomplish a given military objective.

⁴ Dr Joe Strange states on P. 24 of "Center of Gravity What Clausewitz Really Meant", *JFQ*, Issue 35, 2005. "There is no doubt that Clausewitz meant COG as the main strength of an enemy."

⁵ Col Mark Cancian articulates in his Joint Warfighting Essay contest winning article, "Centers of Gravity are a Myth", P.3, *US Naval Institute*. That during planning for Desert Storm the USAF designated 4 strategic COGs (Electrical Production, Telecommunications, Military Production & Oil Refining).

that the entire weight of the bodies acts through the COG. In order to balance an object against gravity with a single force, that force must lie in a vertical line that runs through the COG.⁶ In other words, the singular focal point or COG for the body as a whole resides in one location. If that location is impacted then the COG will be impacted and the gravitational pull of the earth will overwhelm the body and it will fall to the ground.

One object that could be used to illustrate this is a foot long ruler. It is a common held principle that a foot long ruler is twelve inches long. Through experimentation it has been determined that the COG resides approximately at the six inch mark on the ruler. Changes can be made in thickness, weight, and width, however, the fact remains that in order to balance a ruler you must determine the encompassing principle that will affect the ruler overall with regards to gravity. That one encompassing principle is that the COG is determined from where that ruler can be balanced as a singular whole. Other changes can be made, but they prove insignificant in regards to the COG of the ruler. The COG of a foot long ruler will always be located at a singular focal point at approximately six inches.

Physics to Humans: The Center of Gravity

So how do the principles of physics convert into more complex and sophisticated objects, such as humans? Calculating the center of gravity of complex objects, such as humans is difficult due to the fact they have so many moving parts. Objects such as humans must be artificially frozen in time and space because if their distribution of

⁶ World Wide Web: Physics theory, Center of Gravity. <http://theory.uwinnipeg.ca/physics/rot/node4.html>

weight or position changes it will force the COG to move.⁷ An example of this is to take a human and stand him upright. The COG for the human will reside in the middle of the pelvis, roughly behind the belly button. If a human were to raise his arms, the COG moves to a position that is higher on the pelvis than before. If a pack is placed on the humans back the COG will again shift. If the human becomes locked in a struggle with another human, the gravitational forces acting on both bodies will affect the COG of each human. A physicist could treat both masses as one and calculate a common center of gravity of the total mass; however, if the struggle continues the COG will continue to change as the bodies change position.⁸

Physics to Nations: The Center of Gravity

The COG of a ruler and even a human are simple subjects and finding the COG is relatively easy. But how does this apply to more complex objects such as nations? In relatively the same manner as simpler objects, however, the ability to find the COG may not be as obvious. For instance, Alexander the Great's COG was his army. Had the army been destroyed he would have failed. In states with many factions vying for power, the COG lies mainly in the capital; in small states supported by a more powerful one, it lies in the army of the stronger state; in alliances, it lies in the unity formed by common interests; in popular uprisings, it lies in the persons of the principal leaders and in public opinion.⁹ If these elements are what hold the enemy's system together, then these elements should be the focus for a series of well directed blows to affect them. If the enemy loses his balance because of such a blow, he must

⁷ Clausewitz's *Center of Gravity: It's not what we thought*, P.3, Lt. Col. A.J. Echevarria II, U.S. Army, www.nwc.navy.mil/press/Review/2003/Winter/art4-w03.htm

⁸ Clausewitz's *Center of Gravity: It's not what we thought*, P.3, Lt. Col. A.J. Echevarria II, U.S. Army, www.nwc.navy.mil/press/Review/2003/Winter/art4-w03.htm

⁹ Clausewitz's *Center of Gravity: It's not what we thought*, P.5, Lt. Col. A.J. Echevarria II, U.S. Army, www.nwc.navy.mil/press/Review/2003/Winter/art4-w03.htm

not be given time to regain it. The victor must always direct all of his blows in such a way they will strike at the whole of the enemy, not just part of him.¹⁰

In trying to draw connections between or among an adversary's various parts and trying to determine what holds them together, the identity and location of their COG must be perceived by considering them holistically. In the case of Alexander, his army was not significant because it was a source of power, but rather it enabled him to hold power systems together.¹¹

Can a Center of Gravity (COG) Change?

As the examination of physics demonstrated, a COG is capable of changing. However, the true COG will still influence the overall whole of the object. In referring back to the ruler analogy, the COG of a ruler rest at approximately the six inch mark. What happens if one inch of the ruler is cut off? The COG shifts and now resides at approximately five and one half inches. As the ruler is cut away the COG will continue to change; the invariable constant is that there still only remains one focal point where the ruler can be balanced.

When fighting an enemy force the same phenomena can occur. The focal point or COG that existed during the major conventional combat phases of a war may be different if an insurgency begins. As the insurgency dies down, the COG may shift yet again. Just like a ruler or human body, as weight is taken away or added the make up of the object will change and force the COG to adjust as well.

What is found at the Operational and Tactical Level?

If a COG is a focal point that entails considering the object or enemy as a singular whole (as in strategic), what are the elements of significance within the whole?

¹⁰ Carl Von Clausewitz, On War, Translated by Howard and Paret (1976) Princeton University Press: Princeton, N.J. P. 595-596

¹¹ Clausewitz's *Center of Gravity: It's not what we thought*, P.5, Lt. Col. A.J. Echevarria II, U.S. Army, www.nwc.navy.mil/press/Review/2003/Winter/art4-w03.htm

What are the elements at the operational and tactical level of war that current day doctrine calls COGs?

Elements that exist at the operational and tactical level of warfare are Critical Elements defined as Critical “Operational” Capabilities (COC) and Critical “Tactical” Requirements (CTR). Critical capabilities generate force or persuasion. The COG is the “glue” for those critical capabilities.¹²

Critical Requirements are essential conditions, resources and means for a critical capability to be fully operative.¹³ If a critical requirement is vulnerable to neutralization, interdiction, or attack in a manner achieving decisive or significant results, then it is a Critical Vulnerability (CV).¹⁴

A better illustration of how Critical Capabilities, Critical Requirements, COG and Critical Vulnerabilities can be visualized in an easily comprehensible manner is to utilize a freight train and its components as an example.

Critical Requirements¹⁵:

Tracks:	The tracks do nothing themselves, but support and guide the locomotive
Fuel:	The locomotive uses this to propel itself
Cars:	The cars only carry freight. However, they need the locomotive to pull them
Operators:	Critical to operate the locomotive, but cannot move freight by themselves

Critical Capability¹⁶:

¹²Colonel D.C. Eikmeier, U.S. Army, *Center of Gravity Analysis*, Military Review, July – August 2004, P.3. References Dr. Joe Strange, *Centers of Gravity & Critical Vulnerabilities* (Quantico, VA: U.S. Marine Corps Association, 1996), 93-96. “Operational” and “Tactical” were added by this author for emphasis on what these elements do at the Operational and Tactical level of war. These are the elements at the Tactical and Operational level of war that are wrongly labeled “Centers of Gravity”.

¹³ Ibid, JP 5-0 (D-2), IV-13

¹⁴ Ibid, ix; JP 5-0 (D2), IV-13

¹⁵Colonel D.C. Eikmeier, U.S. Army, *Center of Gravity Analysis*, Military Review, July – August 2004, P.3

¹⁶ Ibid P.3

The Critical Capability is the ability for the locomotive to move freight from one location to another.

Center of Gravity¹⁷:

Locomotive: The one thing in this system where all other things rely upon, or in this case support.

Critical Vulnerability:

If any of the Critical Requirements are vulnerable to interference they become Critical Vulnerabilities.¹⁸

Just like at the tactical and operational level of war, there are many elements that are critical, but are not the singular focal point in the enemy's system. Therefore, they cannot be deemed a COG. There can only be one true COG for any object at any one time, and it always takes into account the object or system as a whole. Like in the train example, the locomotive is the only piece that does not directly support another. Instead, all other elements support the locomotive, thus it is the singular focal point in the overall system. Gaining an understanding of this is the most difficult part of COG analysis and requires a holistic view of the organization's systems¹⁹.

If this holistic approach is skipped then the enemy's true COG will be mis-identified. This failure to view the enemy as a whole, in regards to COG, leads to the current trend to wrongfully label Critical Requirements or Critical Capabilities as Centers of Gravity at the operational and tactical level of war.

What did Clausewitz think?

A quest for understanding of what a COG is and what it is not must begin with Clausewitz, since he was the one who started the critical military thinking on the subject. Since the first writing was in German vice English, it is essential to understand the German context surrounding the words in which Clausewitz chose. If

¹⁷ Ibid P.3

¹⁸ Ibid P.3

¹⁹ Colonel D.C. Eikmeier, U.S. Army, *Center of Gravity Analysis*, Military Review, July – August 2004, P.4

the context is understood, then a broader overall understanding can be developed. When a broader German context is gained it begins to question if the popular held “English” perspective of a COG is correct.

A deeper understanding begins with the words Clausewitz utilized in his original work when referring to what the English translation calls a Center of Gravity. The three words Clausewitz utilized were: *Schwerpunkt*, *Schwerpunktbildung*, and *Schwerpunktverlegung*²⁰. In German the literal translation for *Schwerpunkt* means stress, emphasis or [focal point]. *Schwerpunktbildung* means concentration, main focus or [focal point]. *Schwerpunktverlegung* means a shift in a main focus or [focal point].²¹ The key commonality in the definitions of all three of these words in German is “Focal Point”. So, to disregard the possible significance may misrepresent Clausewitz’s intent. Yet, in current Joint Doctrinal Publications “Focal Point” is not used in the definition of a COG. Quite possibly this is the reason for so much confusion over the concept.

Additionally, it is often forgotten that Clausewitz borrowed a number of intellectual constructs, theories, and concepts from the leading philosophers, scientists, and other thinkers of his day in order to understand and describe what he observed as the various aspects of war.²² Several of his concepts- friction, polarity, and center of gravity- are analogies or metaphors drawn from the “mechanical sciences” (today’s physics). In particular, the original German text reveals that

²⁰ Operational Warfare, Dr. Milan N.Vego, p.308 – 309, NWC 1004, 2000

²¹ Interview with Amy Edtmeyer, Project Manager, Lufthansa Airlines on 19 December 2005. Mrs. Edtmeyer lives in Germany and has worked for Lufthansa Airlines as a professional translator and interpreter for the past twelve years. She obtained a dual major in German and Physics from the University of California at Santa Barbara in three years. Mrs. Edtmeyer is a dual citizen of Germany and the United States. She is fluent in English, German, and French.

²² Echevarria, A.J. Lt. Col, U.S. Army, *Clausewitz’s Center of Gravity: It’s not what we thought*, NWC Review, 2003 P.2, <http://www.nwc.navy.mil/press/Review/2003/Winter/art4-w03.htm>

Clausewitz used the center-of-gravity metaphor- expressed primarily as Schwerpunkt (Main Point or Focal Point) more than fifty times.²³

Clausewitz's use of the center of gravity in his writings remains essentially consistent with the concept's representation in the mechanical sciences. However, the translations of *On War* by Sir Michael Howard and Peter Paret are somewhat misleading. The translation strips away the physics metaphors that Clausewitz used to describe his military concept. These metaphors are essential to understanding Clausewitz's basic ideas. Furthermore, the translations create a false impression that COG derives from "sources" of strength, or that they themselves are "strengths". Clausewitz never used the word "source" (Quelle), and he never directly equated the center of gravity to a strength or source of strength.²⁴

Clausewitz stated:

*[Just as in physics] the center of gravity is always found where the mass is most concentrated... The armed forces of every combatant, whether an individual state or an alliance of states, have a certain unity and thus a certain interdependence or connectivity; and just where such interdependence exists, one can apply the center of gravity concept.*²⁵

Unfortunately, U.S. military analysts and doctrine writers have failed to understand the original context of Clausewitz, preferring instead to interpret Clausewitz's center of gravity literally, as a concentration of force²⁶, strength or will to fight. Using Clausewitz's original word in German, "Schwerpunkt", would be a focal point, not strength. Additionally, COGs would be found where sufficient connectivity exists among various parts of the enemy to form an overarching system.

²³Echevarria, A.J. Lt. Col, U.S. Army, *Clausewitz's Center of Gravity: It's not what we thought*, NWC Review, 2003 P.2, <http://www.nwc.navy.mil/press/Review/2003/Winter/art4-w03.htm>. Echevarria notes that Schwerpunkt is used fifty-three times. Echevarria adds, Clausewitz also used Kern (core) and Zentrum (Center)

²⁴ Echevarria, A.J. Lt. Col, U.S. Army, *Clausewitz's Center of Gravity: It's not what we thought*, NWC Review, 2003 P.2, <http://www.nwc.navy.mil/press/Review/2003/Winter/art4-w03.htm>

²⁵ Von Clausewitz, *On War*, P. 485-486

²⁶ Echevarria, A.J. Lt. Col, U.S. Army, *Clausewitz's Center of Gravity: It's not what we thought*, NWC Review, 2003 P.4, <http://www.nwc.navy.mil/press/Review/2003/Winter/art4-w03.htm>.

At the *Schwerpunkt* a certain force would be present that would hold together the entire system. Thus, a blow at the *Schwerpunkt*, or focal point could throw the enemy off balance and cause the entire system to collapse. A proper utilization of this concept takes the enemy into account holistically.²⁷

Military definitions of COG currently fail to fully encapsulate Clausewitz's sense of "unity" or "connectivity". By doing so, assumptions are often made that certain elements are the enemy's COG, when it is simply not the case. In other words, the U.S. military assumes COG exists where none really are. Instead, Critical Capabilities or Requirements have been wrongly identified and pursued as if they were a COG.²⁸ It is important to remember that Clausewitz considered the calculation of a COG a matter of "strategic judgment" (*Strategische Urteil*), to be addressed at the highest levels.²⁹ In essence, the true focal point (*Schwerpunkt*) is an effect based approach vice a capability based one that is looking for the total collapse of the enemy³⁰. The effects of striking the true COG will be the ability to dissolve the "glue" that holds the system together³¹, vice striking at certain critical capabilities or requirements. The following diagram may assist in portraying a better perspective at what a COG looks like from a holistic perspective. The enemy possesses assets, both military and civilian, that give him certain projection capabilities. These capabilities feed into the COG and the COG is the critical element that holds the system together.

²⁷ Echevarria, A.J. Lt. Col, U.S. Army, *Clausewitz's Center of Gravity: It's not what we thought*, NWC Review, 2003 P.6, <http://www.nwc.navy.mil/press/Review/2003/Winter/art4-w03.htm>

²⁸ Echevarria, A.J. Lt. Col, U.S. Army, *Clausewitz's Center of Gravity: It's not what we thought*, NWC Review, 2003 P.6, <http://www.nwc.navy.mil/press/Review/2003/Winter/art4-w03.htm>

²⁹ *Vom Kriege*, P.324. Cf. *On War*, P. 163

³⁰ U.S. Joint Forces Command, *Rapid Decisive Operations White Paper*, draft dated 16 FEB 2001 (Norfolk, VA: J9 Joint Futures Lab, 2001). It defines effects-based operations as "a process for obtaining a desired strategic outcome or 'effect' on the enemy through the synergistic, multiplicative, and cumulative application of the full range of military and other national capabilities." P.20 (Echevarria)

³¹ Christian Lowe, "In Exercise, U.S. Military Practices Unconventional Warfare," *Defense Week*, 21 May 2001, p.2.

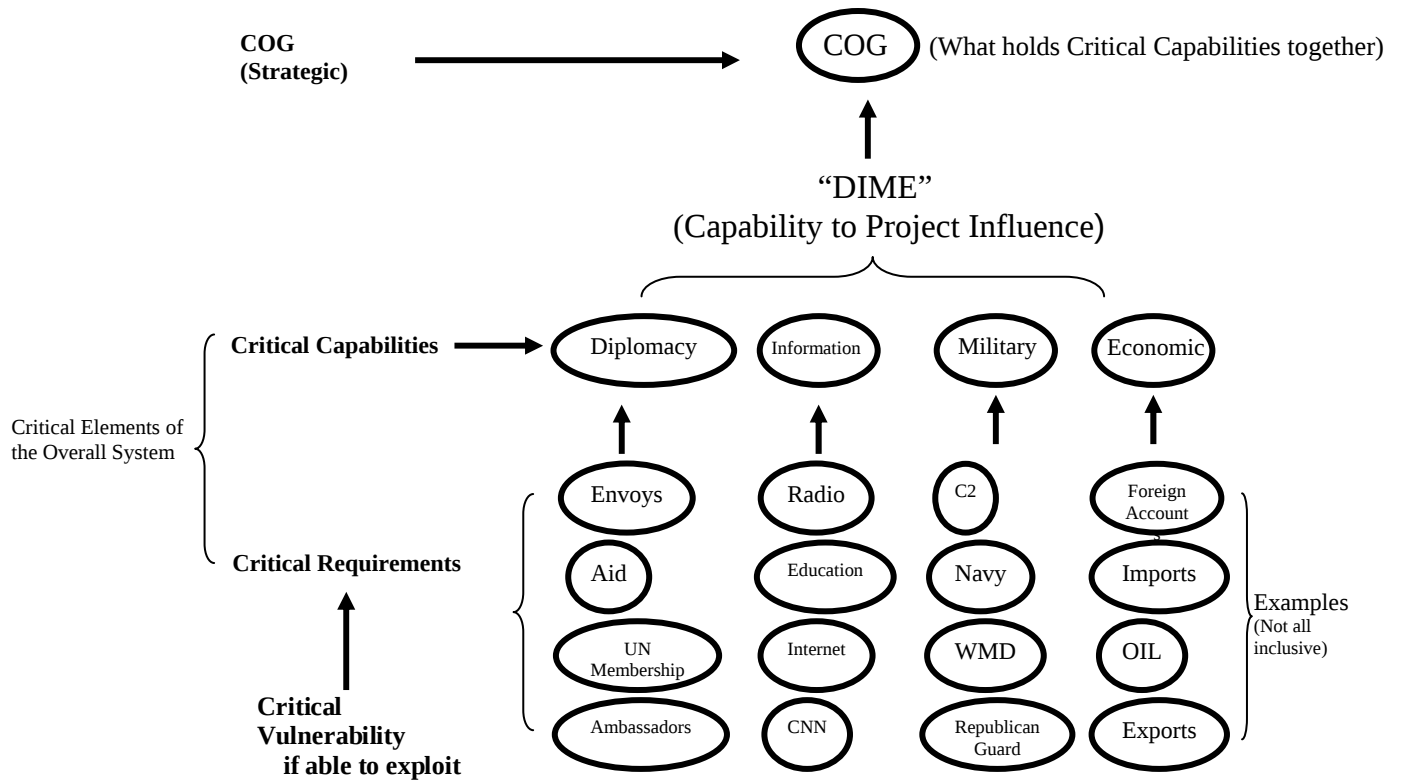


Figure 1: Holistic Enemy Perspective

It is paramount that military thinkers today keep the original context, thought and framework of what Clausewitz originally wrote if a full understanding of COG is to be achieved. *...the hub of all power and movement upon which all our energies should be directed ... if a combatant eliminates or influences the enemy's strategic center of gravity, the enemy will lose control of its power and resources and will eventually fall to defeat. If the combatant fails to adequately protect his own strategic center of gravity, he invites disaster.*³²

Some historical examples have proven Clausewitz's theory that a Center of Gravity is the singular focal point that ties all other elements of an enemy's requirements and capabilities together. Additionally, COGs at the operational and tactical level of warfare have been wrongfully called such and are really Critical

³² Carl Von Clausewitz, On War. Translated by Howard and Paret (1976) Princeton University Press: Princeton, N.J. (Taken from: "Instructable agents for Strategic COG analysis. AORS 2001, Oct 2001)

Requirements or Critical Capabilities. When an enemy is evaluated holistically, the way Clausewitz intended it to be, it becomes obvious why events at the Operational and Tactical have often had little influence in the overall outcome of the conflict or influence on the strategic COG. Historical examples illustrate the lack of unity that occurs when a COG is not properly identified.

Historical Analysis (American Revolution)

The American Revolution provides an example where success at the operational and tactical level did not equate to success at the strategic level. Britain was one of the world superpowers of the time with a powerful military, political architecture, and robust industrial base. As a military, the British strengths lay in their powerful navy, well disciplined army, experienced military and power projection capability. The British knew these strengths and utilized them to fight the colonies during the American Revolution.

On the other end of the spectrum, a glance at the Colonies will show they brought very little to the fight in comparison to their foe. The Colonies could muster few resources and very little power projection capability. Little was left to doubt which side would be militarily decisive in a tactical engagement or larger operation. With rare exception, the more dominate British military was able to put the colonist on their heels at the tactical and operational levels and keep them there throughout the war. However, in the end, it was Britain who sailed back across the Atlantic in defeat after winning at the operational and tactical levels. Why was this?

General Washington was able to win the war because he fully understood that the real COG for the British lay not at the tactical or operational levels, but at the strategic level. Success for the colonies tactically or operationally would have been great. However, Washington knew that victories at these levels would not address the true British COG; rather it would only address Critical Requirements or Critical

Capabilities of the British on these levels. As long as Britain had the will to fight they could continue to push war material across the Atlantic and project their military influence on the colonies.

As Washington assessed, the British COG was the will of the British government to continue the fight against the colonies.³³ Washington knew that this COG laid an ocean away and was not directly accessible with the resources that the Continental Army could utilize. Washington knew the enemy could not likely be defeated operationally or tactically, and could only be defeated strategically when it determined that it had suffered enough. For Washington, the only way he saw for America to win the war was to avoid defeat.³⁴ In essence, a Fabian strategy combined with Mao concepts of a prolonged war would be the only way Washington could attack the British COG and break the singular focal point that kept the British in the colonies. Washington was successful in identifying the enemy's COG and found a way to defeat the critical requirements and capabilities that were the avenue to that COG.

From the British perspective they tried to fight the war the way that had made them successful in the past. Pit army against army in open battle and seize the enemies' capital. However, what the British failed to realize is that the colonies were largely agricultural. Capturing a city, even Philadelphia, would not end the war. No city was of any enormous political or industrial significance. It took the British well into the war to realize that the real COG for the Colonies was Washington's elusive Army. Washington knew this long before, thus adapted his tactics to protect his own COG while indirectly attacking the British COG through a protracted campaign.³⁵

³³ Weigley, Russell F., The American Way of War, Indiana University Press, Bloomington, Indiana, p. 5

³⁴ John G. Fox, "Did Clausewitz win the American Revolutionary War?", National Defense University, National War College, Course 5602, Seminar C, Class of 2000, p.9

³⁵ John G. Fox, , "Did Clausewitz win the American Revolutionary War?", National Defense University, National War College, Course 5602, Seminar C, Class of 2000, p.7

Historical Analysis (Vietnam)

Another conflict almost 200 years later amplifies some of the same conclusions. As pointed out in an article published by *Army Magazine*; the Army's inability to link battlefield success to strategic victory...played a major role in the loss of South Vietnam.³⁶ The U.S. was successful in attacking enemy critical capabilities and requirements at the tactical and operational level of the war, but the failure to clearly understand the real enemy COG, that lie at the strategic level, was cause for the ultimate failure by the U.S.

On a tactical and operational level nearly every battle and major operation went in favor of the U.S. Forces. At the operational and tactical level the American forces on the ground were successful in taking the fight to the enemy and beating him. However, operational and tactical success did not achieve the desired strategic goals of U.S. policy. If such success was achieved at the tactical and operational level, then why was success not achieved at the strategic level?

When an evaluation of the U.S.'s strategic focus is conducted; the real COG was the North Vietnamese Government and that was not sufficiently attacked. Instead, America massed against the Viet Cong in search & destroy and pacification efforts. As a result, the concentration on the real COG was not done. Thus, the failure to focus on the real COG frittered away military resources on inconclusive military and social operations that ultimately exhausted the patience of the American people.³⁷ Had the U.S. focused its efforts on the element that held the enemy together, the tactical and operational success would have been tied to strategic success. Though the U.S. was clearly successful in destroying critical elements of enemy resources and

³⁶ Col R.B. Killebrew, US Army, "Winning Wars", *Army Magazine*, April 2005, p.1

³⁷ John M. Gates, The U.S. Army and Irregular Warfare, Ch 7, p 7. Mr. Gates is summarizing writings by Col H.G. Summers Jr. www.wooster.edu/history/jgates/book-ch7.html

capabilities at the tactical and operational level, they were not Centers of Gravity, rather just critical elements.

The North Vietnamese understood this concept and similar to General Washington 200 years earlier, were able to preserve their own COG while striking at the U.S.'s COG through a protracted war. North Vietnam capitalized on the knowledge that the U.S. did not want to escalate the war outside Vietnam, that the U.S. needed popular support at home, and that a protracted war was North Vietnam's greatest vehicle for success. Just like General Washington, as long as the North Vietnamese did not lose too early, the war would go in their favor. This logic of thought was amplified some years later in an exchange after the U.S. withdrawal from Vietnam. A U.S. officer said to a North Vietnamese colonel, "Remember, you never defeated us on the battlefield." The NVA officer responded, "That may be so, but it was also irrelevant."³⁸

Historical Analysis (Desert Storm)

Almost twenty years after the war in Vietnam, the U.S. once again found itself facing another enemy. This time it was the Iraqi Army under the leadership of Saddam Hussein. As the U.S. began detailed planning, COGs were discussed, and the debate amongst military planners began.

The Air Force was insistent that the COGs were electricity production facilities, telecommunications, military production facilities, and oil refineries. The Air Force claimed that destruction of these targets would inflict so much pain that the Iraqi leadership would opt to change their policies. The Republican Guard was originally

³⁸ Col. R.B. Kellebrew, US Army, *Winning Wars*, *Army Magazine*, April 2005 p.2

not even targeted by the Air Force, the Air Force planners saw these units as merely a distraction.³⁹

The Army planned to focus on the Republican Guard. Generals Schwarzkopf and Powell believed that these divisions were the “glue” that held together Saddam’s regime. Without the Republican Guard, Saddam would not be able to suppress dissent and would fall from power.⁴⁰

The Navy wanted to conduct a maritime blockade aimed at strangling commerce and interdicting the export of Iraq’s oil.⁴¹

Each of these quote “Centers of Gravity” were attacked with vigor yet the impacts on the enemy were marginal. When Operation Desert Storm was completed, tactical and operational level units had executed their missions better than anyone thought possible. However, on a strategic level Saddam was still in power, was still able to export oil resources, develop Weapons of Mass Destruction, and still maintained the ability to be a viable threat to the region. Once again, tactical and operational success did not deliver the strategic success that current doctrine claims.

Historical Analysis (The War on Terror)

It is too early to determine whether this trend will continue for the Global War on Terrorism. What is determinable is that current war fighting doctrine focuses too much on trying to define centers of gravity at every level of warfare. Since truly definable centers of gravity so rarely exist, if ever, at the operational and tactical levels in a way that is useful for planners, joint doctrine would be better off focusing on⁴² high level focal points that tie lower level capabilities and resources together.

With resources and capabilities spread throughout the world, it is even more

³⁹ Colonel Mark Cancian, USMCR, Joint Warfighting Essay Contest Winner, Centers of Gravity are a Myth, *Proceedings*, September 1988, p 3.

⁴⁰ Ibid p.3

⁴¹ Ibid p 3

⁴² Colonel Mark Cancian, USMCR, Joint Warfighting Essay Contest Winner, Centers of Gravity are a Myth, *Proceedings*, September 1988, p 8.

important today that we recognize that in order to win a war such as the GWOT, strategic level effects on the enemy are the only effects that are going to be effective.

The paradigm of warfare with a distinction between the strategic, operational and tactical levels is inviolate and needs to be replaced with one that regards all activities of war as holistic. Clausewitz did not distinguish between tactical, operational, or strategic centers of gravity; he defined the center of gravity holistically- that is, by the entire system (or structure) of the enemy- not in terms of levels of war.⁴³ If a change of perspective in defining and analyzing the enemy's center of gravity is not done, the confusion and lack of understanding surrounding a COG will only get worse. If a true victory is to be accomplished all elements of national power projection capability must be evaluated in order to find the true center of gravity. This will only be accomplished if we understand and view the enemy as a holistic entity with only one true focal point that ties all his capabilities together.

⁴³ Echevarria, A.J. Lt. Col, U.S. Army, *Clausewitz's Center of Gravity: It's not what we thought*, NWC Review, 2003 P.6, <http://www.nwc.navy.mil/press/Review/2003/Winter/art4-w03.htm>

BIBLIOGRAPHY

Andrew Krepinevich, "The War in Iraq: The Nature of Insurgency Warfare", *CSBA FOUNDATION*

Antulio Echevarria, "Clausewitz's Center of Gravity- It's not what we thought" *NWC Review*, winter 2003, <http://www.nwc.navy.mil/press/review/2003/winter/art4-w03.htm>

Antulio Echevarria "Center of Gravity: Recommendations for Joint Doctrine", *Joint Force Quarterly*, Issue 35, 2005, National Defense University Press

Author Unknown, "The Center of Gravity- How Heavy Should a Throwing Knife Be?" *The Physics of knife throwing*.
http://www.knifethrowing.info/weight_centerofgravity.html

Brian Blodgett, "Clausewitz and the Theory of Center of Gravity as It Applies to Current Strategic, Operational, and Tactical Levels of Operation", brian.blodgett@comcast.net.
http://members.tripod.com/Brian_Blodgett/CoG.htm

Carl Von Clausewitz, *On War*, Translated by Howard and Paret (1976), Princeton University Press, Princeton, N.J.

Christian Lowe, "In Exercise, U.S. Military Practices Unconventional Warfare," *Defense Week*, May 2001

Dale Eikmeir "Center of Gravity Analysis", *Military Review*, July / August 2004

Definition: Center of Gravity. <http://theory.uwinnipeg.ca/physics/rot/node4.html>

Dr. Christopher Bassford, "Nonlinearity in Marine Corps Doctrine", *Maneuver Warfare Science*, USMCCDC, 1998 www.clausewitz.com

F. Kessel, P. Cole and D. Johnson, “Selvet som fortaellingens tyngdepunkt”, *Philosophia*, “The Self as a Center of Narrative Gravity” *Perspectives*.

ase.tufts.edu/cogstud/papers/selfctr.htm

Joe Strange and Richard Iron, “Center of Gravity: What Clausewitz Really Meant”, *Joint Force Quarterly*, Issue 35, 2005, National Defense University Press.

John G. Fox, “Did Clausewitz Win the American Revolutionary War”, *Research Paper*, National Defense University, National War College, 2000

John M Gates, *The U.S. Army and Irregular Warfare*, Ch 7 *Vietnam: The debate goes on*.
www.wooster.edu/history/jgates/book-ch7.html

Joint Publication 3-0, *Doctrine for Joint Operations*, 10 September 2001

Mark Cancian , “Centers of Gravity are a Myth”, *Proceedings*, September 1998

Milan N. Vego, *Operational Warfare*, NWC 1004, 2000.

Robert Killebrew “Winning Wars”, *Army Magazine*, May 2005, Volume 3

<http://www.ausa.org/pdfdocs/RBKillebrew.pdf>

Russell F. Weigley, *The American Way of War*, Indiana University Press, Bloomington, Indiana

U.S. Joint Forces Command, “Rapid Decisive Operations White Paper”, draft Feb 2001, Norfolk, VA

W.H. Cleckner, G. Tecuci, J.J. Comello, *Proceedings of the Army Operations Research Symposium, (AORS –October 2001)* “Indestructable Agents for Strategic Center of Gravity Analysis”

World Wide Web: “Physics Theory”, Center of Gravity.