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Do Not Resuscitate Shock and Awe as a Cyber Crisis Resolution Concept

Michael P. Fischerkeller

As states assess how to maximize cyber effects in militarized crises with peer opponents, the concept of *shock and awe* is being resuscitated. By inducing pause during a crisis, the logic goes, an opponent will re-evaluate the risks of pursuing their revisionist objectives, conclude they cannot be achieved at an acceptable cost, and accept a return to the pre-crisis status quo. A superficial consideration of the potential military effects of a surprise, massive cyber onslaught might suggest this is an efficient and profitable option. A deeper assessment, however, argues for a different conclusion. Cyber shock and awe is difficult, if not impossible, to achieve against peer opponents. Moreover, shock and awe represents a non-gradual approach to crisis management, which is counter to what we know about how great powers historically have resolved crises short of war. Thus, cyber shock and awe will likely increase the risks of escalating into war. Finally, shock, which tactical surprise intends to engender, has not deterred opponents from significant military retaliation or made armed conflict less deadly when deterrence has failed.

Shock and Awe: Back in the News

Recent commentaries on the Russia-Ukraine crisis argue that a Russian invasion would likely first employ massive cyber and electronic warfare tools and long-range precision missiles to target military command and control systems or civilian critical infrastructure and create *shock and awe*.¹ Jonathan Reiber described the same by claiming “We could see a coordinated campaign of cyberspace operations targeting the Ukrainian government’s senior leader communications, military critical infrastructure and communications, and aspects of Ukrainian national critical infrastructure, to include the energy, manufacturing, and media sectors” that “could extend far beyond what the Russian government has done to Ukraine in the past.”² Lennart Maschmeyer and Nadia Kostyuk have been skeptical, holding the view that intrinsic cyber operational constraints—the operational trilemma³—flowing from the requirements of secrecy for cyber operations, limit the ability to scale cyber operations to coercively deliver grand strategic gains in militarized crises or war.⁴

¹ See William Courtney and Peter A. Wilson, “If Russia Invaded Ukraine,” *TheRANDBlog*, December 12, 2021, <https://www.rand.org/blog/2021/12/expect-shock-and-awe-if-russia-invades-ukraine.html> and Keir Giles, “Putin Does Not Need to Invade Ukraine to Get His Way,” Chatham House, December 21, 2021, <https://www.chathamhouse.org/2021/12/putin-does-not-need-invade-ukraine-get-his-way>.

² Quoted in Maggie Miller, “Russian Invasion of Ukraine Could Redefine Cyber Warfare,” *Politico*, January 28, 2022, <https://www.politico.com/news/2022/01/28/russia-cyber-army-ukraine-00003051>.

³ Lennart Maschmeyer, “The Subversive Trilemma: Why Cyber Operations Fall Short of Expectations,” *International Security* 46, no. 2 (2021): 51–90.

⁴ Lennart Maschmeyer and Nadia Kostyuk, “There Is No Cyber ‘Shock and Awe’: Plausible Threats in the Ukrainian Conflict,” *War on the Rocks*, February 8, 2022, <https://warontherocks.com/2022/02/there-is-no-cyber-shock-and-awe-plausible-threats-in-the-ukrainian-conflict/>.

Perhaps, however, for strategic reasons states have not yet opted to use cyber capabilities at the scope, scale and intensity that the shock and awe concept prescribes.⁵ What if the stakes were much higher, such as during a great power militarized crisis? Should the shock and awe concept and the surprise it engenders be resuscitated as a cyber option for militarized crises?

Policymakers should be skeptical of cyber shock and awe because the strategic conditions necessary for its success do not exist today and the desired strategic outcomes are not likely to be achieved. This strategic argument has a different orientation from Maschmeyer's operational trilemma where constraints on cyber shock and awe flow from a cyber operational requirement for secrecy, not from features of the overall strategic environment. A review of the original shock and awe concept, assessments of today's strategic environment, and a summary of what we know about strategic outcomes that follow from surprise attacks makes it abundantly clear that strategic vice operational constraints pose an equal, if not greater, challenge to the salience of cyber shock and awe.

What Is Shock and Awe?

Rapid dominance through shock and awe (hereinafter shock and awe) was first described in a 1996 National Defense University publication. Harlan Ullman, lead author of the force concept, appears to have recently re-branded it as "Massive Attacks of Disruption" to give cyber operations a more robust role, but the core elements are intact.⁶

According to the original force concept, the goal of rapid dominance is to destroy or so confound the will to resist that an adversary has no alternative except to accept one's strategic aims and military objectives.⁷ *Dominance*—the ability to destroy the adversary's will or degrade their resolve both physically and psychologically—is achieved by "targeting the adversary's will, perception, and understanding" through shock and awe.⁸ A rapid-dominance military force displays "near total or absolute knowledge and understanding of self, adversary, and environment; rapidity and timeliness in application; operational brilliance in execution; and (near) total control and signature management of the entire operational environment."⁹ This enables the force to anticipate and counter all opposing moves, deny an opponent assets or functions of critical value, and to convey the unmistakable message that unconditional compliance is the only available recourse. More than the direct application of force, rapid dominance means controlling the environment, mastering all levels of an opponent's activities to affect will, perception, and understanding. This could include means of communication, transportation,

⁵ Harlan Ullman and James Wade, Jr., with L.A. Edney, Frederick Franks, Jr., Charles Horner, Jonathan Howe, and Keith Brendley, *Shock & Awe: Achieving Rapid Dominance* (National Defense University, 1996).

⁶ Ullman recently introduced massive attacks of disruption when arguing that, in today's strategic environment "The needed defense strategy to achieve these aims [detering China and Russia] must employ [cyber] MAD in close conjunction with traditional kinetic capabilities configured to impose unacceptable costs on any initial enemy attack thereby reinforcing deterrence." Harlan Ullman, "The Missing 'D' in Defending the Nation: Disruption," *U.S. Naval Institute Blog*, February 1, 2022, <https://blog.usni.org/posts/2022/02/01/the-missing-d-in-defending-the-nation-disruption>.

⁷ Ullman and Wade, xxiv.

⁸ Ullman and Wade, xxvii.

⁹ Ullman and Wade, xii. These characteristics also describe the conditions that must be realized for *rapid dominance through shock and awe* to achieve its objectives.

food production, water supply, and other aspects of infrastructure as well as the denial of military responses.¹⁰ Additionally, this control must be enduring, that is, “allow dominance over as much time as is necessary, lest an enemy mistakenly try to wait it out and use time between attacks to recover sufficiently ... Control is thus best gained by the demonstrated ability to sustain the stun effects of the initial rapid series of blows long enough to affect the enemy’s will and his means to continue. There must be a staying power effect on the enemy or else they merely absorb the blows, gain in confidence and their ability to resist, and change tactics”¹¹

Finally, a final core premise of the original force concept was that the United States (in 1996) was dominant. “Simply put, there is no external adversary in the world that can successfully challenge the extraordinary power of the American military in either regional conflict or in ‘conventional’ war as we know it once the United States makes the commitment to take whatever action may be needed.”¹²

Evaluating the Premise and Conditions for Success for Today’s Strategic Environment

For the concept of cyber shock and awe to be relevant in today’s strategic environment, the premise must still be valid and the characteristics of the force—three of which are better understood as necessary conditions for success—must be plausibly achievable. If any hold fast, then there may be some merit to cyber shock and awe.

However, the premise underpinning shock and awe is not valid in today’s strategic environment. A host of recent U.S. national and DoD strategic guidance makes clear that the United States faces two peer competitors: Russia and China. The 2018 *National Defense Strategy* describes every domain as “contested”—land, sea, air, space, and cyberspace.¹³ Recent events between Russia and Ukraine demonstrate Russia’s significant local conventional military advantage should it choose to use military force to achieve its objectives in Ukraine. Similarly, U.S. planning in anticipation of a potential Chinese attack on Taiwan presumes China’s significant local conventional military advantage should it choose to use force to achieve its objectives regarding Taiwan. Nor is the United States dominant vis-à-vis Russia and China in cyber capabilities. Thus, if conventional force dominance is necessary for cyber shock and awe to resolve militarized crises in our favor, then the concept is not valid. This holds even if dominance is only required in cyberspace and the electromagnetic spectrum.

The absence of dominance in today’s strategic environment calls into question whether the United States could establish the conditions for cyber shock and awe to succeed: near total or absolute knowledge and understanding of self, adversary, and environment; (near) total control and signature management of the entire operational environment; and sustain the stun effects of the initial rapid series of blows long enough to affect the enemy’s will.

Regarding the first condition, cyberspace and space campaigns and operations generally play critical roles in understanding the adversary and the environment, and they would play an outsized intelligence

¹⁰ Ibid.

¹¹ Ullman and Wade, 13–14.

¹² Ullman and Wade, xxvii.

¹³ *Summary of the 2018 National Defense Strategy of the United States of America*, 3, <https://dod.defense.gov/Portals/1/Documents/pubs/2018-National-Defense-Strategy-Summary.pdf>.

support role in support of a cyber shock and awe concept. But cyberspace is a contested domain in which superiority is always at risk.¹⁴ The space domain is also congested, contested, and competitive.¹⁵ Taken together, this makes near total or absolute knowledge of self, adversary, and environment implausible.

Similarly, the modern electromagnetic operational environment is increasingly congested, contested, and constrained,¹⁶ rendering (near) total control and signature management of the entire operational environment unrealistic.

Finally, the implausibility of establishing the above two conditions makes clear that sustaining the stun effects of the initial rapid series of blows long enough to affect the enemy's will is also implausible.

In sum, *cyber shock and awe* has questionable merit because, in today's strategic environment, the premise of dominance is not valid and the establishment of the conditions necessary for its success is implausible.

Cyber Shock and Awe Would Increase the Likelihood of Escalation from Militarized Crises to Armed Conflict

The authors of the shock and awe concept claimed it to be equally valuable in both armed conflict and crises.¹⁷ Armed conflict and crisis, however, are two distinct conditions. Although states may be incentivized to end armed conflicts quickly by adopting a shock and awe-like concept,¹⁸ such extraordinary disruption to a gradual crisis management approach could result in unintended escalation into armed conflict.

Crisis decision-making experts stress the need to start low on the escalation ladder, gradually escalating to consistently establish resolve and commitment.¹⁹ Starting low preserves options that reduce the risk

¹⁴ See *Achieve and Maintain Cyberspace Superiority: Command Vision for U.S. Cyber Command*, April 2018, <https://www.cybercom.mil/Portals/56/Documents/USCYBERCOM%20Vision%20April%202018.pdf> and U.S. Department of Defense, *The DoD Cyber Strategy*, April 2015, https://archive.defense.gov/home/features/2015/0415_cyberstrategy/final_2015_dod_cyber_strategy_for_web.pdf.

¹⁵ *National Security Space Strategy 2011 (Unclassified Summary)*, January 2011, <https://www.dni.gov/index.php/newsroom/reports-publications/reports-publications-2011/item/620-national-security-space-strategy>, 1.

¹⁶ "Contested - Enemy activities detect, disrupt, exploit, degrade, deny, deceive, or destroy friendly EMS capabilities for the purpose of military advantage. Congested - Military and civilian EMS-dependent systems continue to crowd the spectrum and increase the amount of unintentional interference. Constrained - Domestic and international regulations cause the amount of spectrum available for military access to decrease." *2020 Department of Defense Electromagnetic Spectrum Superiority Strategy*, 4, https://media.defense.gov/2020/Oct/29/2002525927/-1/-1/0/ELECTROMAGNETIC_SPECTRUM_SUPERIORITY_STRATEGY.PDF.

¹⁷ Ullman and Wade, 19, 55.

¹⁸ Incentives include the potential for victory through far less loss of blood and treasure. See Steven Van Evera, *Causes of War: Power and the Roots of Conflict* (Ithaca: Cornell University Press, 2001).

¹⁹ Glenn H. Snyder and Paul Diesing, *Conflict Among Nations* (Princeton: Princeton University Press, 1977), 225-227.

of violence quickly escalating out of control.²⁰ It also allows one to gain insight into the opponent's responses, level of resolve, and likely reactions to more extreme actions. This approach is the historical norm during crises that averted armed conflict.

Those who call for starting high on the escalation ladder claim that starting low may signal timidity and indecisiveness. It prolongs the crisis, providing the opponent time for counter-coercive tactics, rather than resolving the crisis quickly and on one's terms. Cyber shock and awe starts high and carries risks, including being viewed as irresponsible and reckless. Senior U.S. defense leaders' quickly condemned Russia's "escalate to de-escalate" concept, which called for using tactical nuclear weapons to de-escalate a crisis.²¹

Additionally, choosing extreme action before one has had a chance to establish credibility and resolve may paradoxically be seen by an opponent as a shortcut to avoid demonstrating resolve and commitment by starting low.²² In game theory terms, if one views the opponent as playing "Chicken," shock and awe may be a good strategy. If the opponent is not playing "Chicken," it could quickly lead to an escalatory reprisal.

A cyber shock and awe campaign may be viewed as demonstrating a lack of commitment for another reason. If the cyber shock and awe campaign targets an opponent's critical infrastructure with reversible cyber operations, the opponent may conclude that the defender is providing itself a "graceful exit" should it not wish to (if it even could) sustain the campaign's effects.²³

Finally, as Erik Gartzke argued:

It is one thing for an opponent to interrupt a country's infrastructure, communications, or military coordination and planning. It is another to ensure that the damage inflicted translates into a lasting shift in the balance of national power or resolve. Cyberattacks are unlikely to prove particularly potent in grand strategic terms unless they can impose substantial, durable harm on an adversary. In many, perhaps most, circumstances, this will occur only if cyberwar is accompanied by terrestrial military force or other actions designed to capitalize on any temporary incapacity achieved via the internet.²⁴

²⁰ That said, as I've argued elsewhere, the use of cyber operations during militarized crises generally increases the risk of inadvertent or accidental escalation into armed conflict and so this gradualism finding applies best to non-cyber means for managing escalation. See Michael P. Fischerkeller, *What Do We Know about Cyber Operations During Crises?* (IDA NS D-32909, Alexandria: Institute for Defense Analyses, 2022), <https://www.ida.org/research-and-publications/publications/all/w/wh/what-do-we-know-about-cyber-operations-during-crises> and Michael P. Fischerkeller, "What Do we Know about Cyber Operations During Crises?" *Atlantic Council Issue Brief*, January 31, 2022, <https://www.atlanticcouncil.org/in-depth-research-reports/issue-brief/what-do-we-know-about-cyber-operations-during-militarized-crises/>.

²¹ *Statement of Robert Work, Deputy Secretary of Defense and Admiral James Winnefeld, Vice Chairman of the Joint Chiefs of Staff, Before the House Committee on Armed Services*, June 25, 2015, <https://docs.house.gov/meetings/AS/AS00/20150625/103669/HHRG-114-AS00-Wstate-WorkR-20150625.pdf>. On the concept of escalate to de-escalate, see Stephen J. Blank, ed., *The Russian Military in Contemporary Perspective* (Carlisle Barracks, PA: United States Army War College Press, 2019).

²² Snyder and Diesing, 225–227.

²³ See Thomas C. Schelling, *Arms and Influence* (New Haven, CT: Yale University Press, 2008), 48.

²⁴ Erik Gartzke, "The Myth of Cyberwar," *International Security* 38, no. 2 (Fall 2013): 41-73, 43, <https://www.belfercenter.org/publication/myth-cyberwar-bringing-war-cyberspace-back-down-earth>.

From this perspective, cyber shock and awe alone will not destroy the will or degrade the resolve of an opponent unless it is accompanied by a traditional, conventional force attack. Coupling cyber shock and awe with a conventional-force attack would, again, disrupt gradual crisis management and increase the risk of escalation into armed conflict.

Cyber Shock and Awe Is Not Likely to Produce Desired Strategic Outcomes

Surprise, by its very nature, is a psychologically traumatic event, not merely a physical event happening at a time and place. Shock constitutes the cognitive and emotional responses to surprise, individually and collectively.²⁵ As Clausewitz posited, “When [surprise] is achieved on a grand scale, it confuses the enemy and lowers his morale.”²⁶ Surprise, then, is a key element of the shock and awe concept.

Most military strategists agree that tactical surprise can act as a force multiplier. But many studies of surprise do not look beyond the opening “bolt from the blue.”²⁷ Richard Betts argued that most major wars since 1939 (to 1980) have begun with sudden attacks and that those attacks were “successful” in that the opponent was surprised.²⁸ Whether surprise is an advantageous way to deter or initiate conflict was not examined systematically until Scott Helfstein’s study of 13 surprise attacks between 1950 and 1990. Surprise attacks are defined as centrally planned acts of violence initiated in the hopes of deterring or disabling an opponent,²⁹ similar to how cyber shock and awe might be applied in militarized crises. Three findings are of particular import to those promoting cyber shock and awe.

First, surprise is unlikely to achieve a deterrent effect.³⁰ In none of the 13 cases examined where opponents suffered a major surprise attack were they subsequently deterred from taking action. In every case, the opponents mounted a military response, and in some cases they were victorious. The assumption that a major surprise and the shock it engenders will break the will and resolve of an opponent and deter an escalatory response is questionable.³¹

Second, should deterrence fail, proponents of surprise attacks argue that the attacks can effectively degrade or disable an opponent’s military capabilities to help ensure that a broader military engagement is less violent and deadly. The evidence shows that larger surprises do not guarantee less costly wars (as measured by casualties less than 10,000) and inversely correlate with the deadliest wars (where casualties are greater than 10,000).³²

²⁵ Charles B. Vandeeper, James L. Regens, and Matthew R.H. Uttley, “Surprise and Shock: An Enduring Challenge,” *The Strategy Bridge*, October 27, 2020, <https://thestrategybridge.org/the-bridge/2020/10/27/surprise-and-shock-in-warfare-an-enduring-challenge?format=amp>.

²⁶ Carl Von Clausewitz, *On War*, edited and translated by Peter Paret and Michael Howard (Princeton, NJ: Princeton University Press, 1976): 142.

²⁷ Charles F. Parker and Eric K. Stern, “Bolt from the Blue or Avoidable Failure? Revisiting September 11 and the Origin of Strategic Surprise,” *Foreign Policy Analysis* 1, no. 3 (2005): 301–331.

²⁸ Richard K. Betts, “Surprise without Warning: Why Sudden Attacks Succeed,” *Political Science Quarterly* 95, no. 4 (Winter 1980–81): 551–572, <https://www.jstor.org/stable/pdf/2150604.pdf>.

²⁹ Scott Helfstein, “Backfire: Behavioral Decision Making and the Strategic Risks of Successful Surprise,” *Foreign Policy Analysis* 8, no. 3 (July 2012): 275–292, <https://www.jstor.org/stable/24910768>.

³⁰ Helfstein, 284.

³¹ Van Evera notes the same. Van Evera, *Causes of War*, 71.

³² Helfstein, 284.

Finally, surprise attacks did not increase the likelihood that their initiators were victorious in the broader military engagement.³³

Helfstein explained these findings with prospect theory, which argues that persons or groups are more likely to be risk acceptant in the face of losses.³⁴ Surprise attacks place an opponent potentially deeply into the domain of losses, increasing their willingness to accept risks to prevent further losses and/or return to the status quo. Thus, the attacker would need to impose ever greater costs to achieve its objectives as the crisis or war continues.

Policymakers who may be considering cyber shock and awe must be leaning on their own theory of psychology if they believe that surprise degrades will and resolve to a point of concession. They should present empirical evidence given the risks described above.

Conclusion

Today's strategic environment and the nature of crisis dynamics call into question the prudence of employing cyber shock and awe, an approach that presumes dominance and breaks from the gradual escalation management protocol that great powers have historically used to avoid escalation from crises into armed conflicts. Proponents of cyber shock and awe must come to terms with the fact that the conventional wisdom regarding the value of surprise attacks to deter or, if deterrence fails, limit the violence of an armed conflict is not supported by the empirical record. They have much work before them to credibly claim that the concept is a valid approach to crisis resolution today.

³³ Ibid.

³⁴ Daniel Kahneman and Amos Tversky, "Prospect Theory: An Analysis of Decision Making Under Risk," *Econometrica* 47, no. 2 (1979): 263–292, <https://www.jstor.org/stable/1914185>.

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