Exercises and Adversaries:

The Risks of Military Exercises

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Abbreviations

AGI	Auxiliary General Intelligence
CFE	Treaty on Conventional Armed Forces in Europe
EEZ	Exclusive Economic Zone
ELN	European Leadership Network
EU	European Union
IRBM	Intermediate-Range Nuclear Missiles
NATO	North Atlantic Treaty Organization
NDN	Northern Distribution Network
NRF	NATO Response Force
OSCE	Organization for Security and Co-operation in Europe
PfP	Partnership for Peace
PLA	People's Liberation Army
PRC	People's Republic of China
SDI	Strategic Defense Initiative
SHAPE	Supreme Headquarters Allied Powers Europe
START	Strategic Arms Reduction Treaty
USAID	United States Agency for International Development
USAFRICOM	United States Africa Command
USEUCOM	United States European Command
USNORTHCOM	United States Northern Command
USPACOM	United States Pacific Command
USSOCOM	United States Special Operations Command
USSOUTHCOM	United States South Command
USSTRATCOM	United States Strategic Command
USTRANSCOM	United States Transportation Command

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Executive Summary

The U.S. and NATO run hundreds of military exercises each year, which are intended to build capabilities, reassure allies, and to deter adversaries. Despite these goals, military exercises can lead to unintended consequences because adversaries may have incentives to respond that the country running the exercise fails to anticipate. This study examines the potential risks that military exercises can create due to adversary reactions and offers a framework to help combatant commanders better evaluate and mitigate such risks.

We argue that military exercises can create four types of risk—accidents, hostility, reciprocity, and crises. The level of risk an exercise creates is determined by two factors. The first factor is the political environment between the country running the exercise and the potential adversary. The second factor is the perceived level of threat an exercise creates for an adversary. Exercises that have close proximity to the adversary, have high magnitude, and have low transparency all increase the threat level of a military exercise. This creates incentives for an adversary to respond in a way that creates risks for all parties.

Over the course of our four month study, we collected information on over 200 large military exercises from 1969-2016. Using this data, we determined the dangers military exercises create and examined the effects of military exercises over time. We then created an analytical framework, which a combatant commander can use this to evaluate and mitigate the risks a military exercise may run. To test the plausibility and utility of our framework, we conducted case studies on several military exercises that had resulted in negative outcomes. By examining these cases in-depth, we were able to isolate the conditions under which military exercises create danger.

Introduction

Every year the U.S. runs hundreds of security cooperation activities across the globe, including several dozen "major" joint military exercises.[1] In 2015 the U.S. and NATO conducted or participated in nearly 300 military exercises in Europe alone.[2] Although these exercises range greatly in size and mission, they are designed to build military capabilities, improve interoperability, reassure allies, and deter adversaries.[3] In rare cases, countries have used military exercises to mask troop movements in the lead up to war.[4] Despite the routine and ubiquitous nature of most military exercises, they are not without danger. Because military exercises involve military personnel and equipment, they can appear threatening to potential adversaries, who may respond in unanticipated ways that create risk.

Given the high number of exercises that the U.S., its allies, and its adversaries run and the increasing tempo of military exercises in some parts of the world,[5] the potential for unintended

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[1] In 2011, U.S. geographic combatant commands planned or ran 14 major joint exercises in Africa, 22 in Europe, and 18 in the Pacific region, as defined by the combatant commands. CENTCOM, NORTHCOM, and SOUTHCOM also ran exercises and military-to-military training operations, but specific numbers were unavailable. See Andrew Feickert, *The Unified Command Plan and Combatant Commands: Background and Issues for Congress* (CRS Report No. R42077) (Washington, DC: Congressional Research Service, 2013), 35-57, https://fas.org/sgp/crs/natsec/R42077.pdf.

[2] "The Secretary General's Annual Report, 2015," *NATO* (Brussels: NATO Public Diplomacy Division, 2016), 33, http://www.nato.int/nato_static_fl2014/assets/pdf/pdf_2016_01/20160128_SG_AnnualReport_2015_en.pdf.

[3] Kathleen J. McInnis and Nathan J. Lucas, *What Is "Building Partner Capacity?" Issues for Congress* (CRS Report No. R44313), (Washington, DC: Congressional Research Service, 2015), 8, https://www.fas.org/sgp/crs/natsec/R44313.pdf. See "The Secretary General's Annual Report, 2015" 33-34.

[4] Richard K. Betts, *Surprise Attack: Lessons for Defense Planning* (Washington, DC: Brookings Institution Press, 1982). Even in recent years, military exercises have been used as a cover for invasion forces. In 2008, Russia used the military exercise Kavkaz 2008 to move troops to and through the Northern Caucasus, shortly before the invasion of Georgia. See Brian Whitmore, "Did Russia Plan Its War In Georgia?" *Radio Free Europe: Radio Liberty*, August 15, 2008, http://www.rferl.org/content/Did_Russia_Plan_Its_War_In_Georgia__/1191460.html. In 2014, Russia masked its invasion of Crimea with an exercise of 150,000 personnel. See Ian J. Brzezinksi and Nicolas Varangis, "The NATO-Russia Exercise Gap," *Atlantic Council*, February 23, 2015, http://www.atlanticcouncil.org/blogs/natosource/the-nato-russia-exercise-gap.

[5] In 2015, while NATO ran 297 exercises, Russia ran over 4,000 military exercises. See Christopher Harress, "Russian Military Defense Drills 2015: 4,000 Exercises By Armed Forces Conducted This Year, Up From 2014" *The International Business Times*, September 29, 2015, http://www.ibtimes.com/russian-military-defense-drills-2015-4000-exercises-armed-forces-conducted-year-2014-2118576.

political or military consequences is high. Military exercises create risk because a combatant commander or other official planning an exercise may misperceive how a potential adversary will respond. It is difficult to determine another country's intentions and motives and adversaries may have incentives to interpret these in a certain way.[6] Potential adversaries may believe a military exercise is threatening, regardless of the intent or motive behind the exercise. This creates an incentive for an adversary to respond, which can create risk.

Despite these risks, policy makers, military planners, and academics have not studied the effects of military exercises in-depth. As such, they may underestimate the potential risks. Military exercises are frequent events that often occur on an annual or biannual basis.[7] Unlike combat situations, some military exercises are so routine that they do not warrant press releases, even by largely transparent organizations like NATO.[8] Because military planners may see exercises as routine, they may miss the larger stability implications of some military exercises.[9] Additionally, because military exercises are often communicated through signaling, the potential for misunderstandings is high—rarely do countries have an accurate perception of each other's motives and intentions.[10] This means military exercises create risks that may be unanticipated, as a combatant commander may not know or fully evaluate the incentives and motives a potential adversary has to respond.

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[6] Robert Jervis, Richard Ned Lebow, and Janice Gross Stein, *Psychology and Deterrence* (Baltimore: Johns Hopkins University Press, 1985); Robert Jervis, *Perception and Misperception in International Politics*, (New Jersey: Princeton University Press, 1976); Charles L. Glaser, "Political Consequences of Military Strategy: Expanding and Refining the Spiral and Deterrence Models." *World Politics* 44, no. 4 (July 1992); Charles L. Glaser, *Rational Theory of International Politics: The Logic of Competition and Cooperation* (Princeton: Princeton University Press, 2010).

[7] See "Appendix C: Overview of the Bush School Military Exercise Dataset."

[8] "Exercises and Training," *NATO: Supreme Headquarters Allied Powers Europe*, accessed April 17th, 2016, http://www.shape.nato.int/exercises.

[9] Scott D. Sagan, "The Perils of Proliferation: Organization Theory, Deterrence Theory, and the Spread of Nuclear Weapons," *International Security* 18, no. 4 (Spring 1994): 71-74, https://muse.jhu.edu.ezproxy.library.tamu.edu/article/447097/pdf.

[10] Jervis, Lebow, and Stein, *Psychology and Deterrence*.

To address the risks military exercises create, this paper asks two questions. First, when and why are military exercises dangerous? Because military exercises occur in different political environments and create different perceptions of threat to adversarial countries, they run different risks—including accidents, hostility, reciprocity, and crises. Second, how can a combatant commander mitigate the risks of a military exercise? Although risk mitigation strategies can take place at multiple levels of the political and military chain, we focus on the strategies within a combatant commander's control. We do this because combatant commanders are tasked with planning and carrying out military exercises,[11] are responsible for U.S. military action in the regions where military exercises are conducted,[12] and can mitigate risks at the operational level.[13]

To answer these questions, we collected data on over 200 large, military exercises. We present our methodology in the first section of the paper. In the second section, we present an analytical framework to evaluate the potential risks a military exercise might create. We then discuss the dangers military exercises create, which we discovered through our review of historical military exercises and relevant literature. We also provide a larger examination of how the unintended consequences of military exercises can combine over time, leading to escalation. We then offer a series of historical cases studies, which we used to test the plausibility and utility of our framework. Using this, we show how exercises have led to negative outcomes and how a combatant commander might evaluate and alter a military exercise to reduce risks. We then provide a series of recommendations a combatant commander can use to identify and mitigate the risks of military exercises.

[11] Feickert, *The Unified Command Plan*, 12-14.
[12] Ibid., 1-2.
[13] "Joint Publication 1: Doctrine for the Armed Forces of the United States," March 25, 2013, http://www.defense.gov/Sites/Unified-Combatant-Commands.

Methodology

To assess what risks military exercises create and what factors influence the realization of these risks, we collected data on over 200 exercises spanning 1969-2016. By examining these cases, we determined what risks military exercises create and what factors lead to these risks.

Focus of the Study

Our study looks at military exercises, which are defined as "simulated wartime exercises."[14] This definition includes both combat simulations and exercises focused on other missions, such as anti-piracy and crisis response. The study excludes shows of force, missile tests, and other provocations when they occur outside of the context of military exercises. We also exclude traditional military training when it does not occur in the context of a stated military exercise or does not involve troop movements. By focusing solely on military exercises, we are able to determine what risks military exercises can create, rather than the potential risks of general military actions.

Additionally, although military exercises may pose dangers or risks in unsustainable funding,[15] undermined deterrence because of poor performance or under-commitment,[16] and the alienation of allies over disagreements,[17] we focus on the risks adversarial responses create

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[14] Department of the U.S. Army, *Training: Army Exercises* (Army Regulations 350-28), (Washington DC: Army Headquarters, 1997), 3-6, http://www.apd.army.mil/pdffiles/r350_28.pdf.

[15] Janet A. St. Laurent, *Building Partner Capacity: Key Practices to Effectively Manage Department of Defense Efforts to Promote Security Cooperation* (GAO-13-335T) (Washington, DC: U.S. Government Accountability Office, 2013), 13-15, http://www.gao.gov/assets/660/652159.pdf.

[16] In 2013, the U.S. sent only 200 personnel to a major military exercise, equaling the Estonian forces, which led to allied concerns over a lack of commitment. See Luke Coffey and Daniel Kochis, "Steadfast Jazz 2013: U.S. Lackluster Contribution Undermines U.S. Interests in Eastern Europe," *Heritage Foundation*, November 1, 2013, http://www.heritage.org/research/reports/2013/11/steadfast-jazz-2013-us-lackluster-contribution-undermines-us-interests-in-eastern-europe.

[17] Exercises can cause domestic anger. NATO's Operation Dragoon Ride 2015 drew a crowd of anti-NATO protesters in the Czech Republic. See Rick Lyman, "An American Military Convoy in Europe Aims to Reassure

because of another country's military exercises. This relationship creates unique dangers, can lead to escalation, and has largely been ignored in the existing literature.

Data Collection

Over the course of four months, we collected data on 200 military exercises spanning 1969-2016.[18] Because military exercises are considered sensitive, are fairly routine, and are sometimes concealed, many countries do not publish data on their military exercises. As such, we utilized press releases and news reports to collect information on military exercise metrics, including location, duration, force size, and other variables. Given the time constraints, the lack of published research on the topic, and the limited availability of data, we focused our efforts on large magnitude military exercises that involved more than 1,000 personnel. Large magnitude exercises are the most likely to receive news coverage and to be discovered if the exercise is concealed. Additionally, recent military exercises are more likely to have data available. Of the 200 military exercises we collected, 81% occurred after 2001.[19] By researching large military exercises, we developed a first-cut military exercise dataset that allowed us to examine the effects of military exercises.

Although we look at exercises involving many countries, our primary focus is on exercises involving or occurring in close proximity to Russia and China, because the U.S. has particularly contentious relations with these countries. We also examine specific geographic regions, including

Allies," *The New York Times*, March 29, 2015, http://www.nytimes.com/2015/03/30/world/europe/an-american-military-convoy-in-europe-aims-to-reassure-allies.html. Since 2005, environmental groups have protested the U.S.-Australian biannual Talisman Saber exercise. See Oliver Milman, "Great Barrier Reef bombing the latest mishap from 'war games,'" *The Guardian*, July 22, 2013, http://www.theguardian.com/environment/2013/jul/22/great-barrier-reef-bombing-war-games.

[18] See "Appendix C: Overview of the Bush School Military Exercises Dataset."

[19] Ibid.

the Arctic, because the U.S. and other countries run large military exercises in these regions. This increases the potential for unanticipated consequences. Of the exercises in our dataset, Russia led over 28%, the U.S. led 27% (excluding NATO), and NATO ran 29%. By focusing on potential adversaries and in contentious regions, we are able better measure outcomes from military exercises.

Sampling

Our dataset provided a means to understand potential risks and a way to testing our framework. By utilizing our dataset of cases, we determined what dangers military exercises may create and found the specific factors that contribute to these risks. We first identified these risks by examining the responses to historical exercises. We then used our dataset to design an analytical framework capable of explaining the conditions under which an exercises creates risk, by looking at the environment in which exercises occurred, the types of exercises that were run, and the outcomes military exercises created. Lastly, our dataset provided a sample source of cases, which we explored in-depth to find the causal pathway leading to risk realization. The sample of cases in our military exercise dataset allow us to test our framework and show how military exercises can lead to unanticipated consequences and danger.

Analytical Framework

By combining the data we collected on military exercises, we developed an analytical framework to assess what type of risks a military exercises can create. We find that different factors influence the level of risks an exercise runs. Ultimately, two variables determine the risks a military

exercise creates—the political environment and the perceived threat level of the exercise. By understanding these factors, a combatant commander can evaluate the risks of military exercises.

We used the political environment and perceived threat level of military exercises to create a framework that highlights the risks a military exercise may run due to adversarial responses. While adversaries may have different domestic incentives to respond to military exercises, our framework captures the factors that a combatant commander is likely to know—the political environment—and the factors that he or she is able to calibrate—the exercise itself. This allows us to create a "Risk Matrix," which a combatant commander can use to determine and calibrate what risks a military exercise is likely to run.

Our framework allows for the evaluation of risk from any potential adversary's perspective. It is rare for the mission statement of a military exercise to target an adversarial country. Because of misperceptions, miscalculation, and signaling, a potential adversary may find the mission of an exercise threatening, even when the exercise is not specifically targeted against them. For these reasons, our framework interprets "adversaries" very broadly—the political environment and threat level of an exercise can be evaluated using any country dyad.

Political Environment

The first factor determining the potential risks a military exercise creates is the political environment the country running the exercise and the adversary share. Adversaries react to military exercises in different ways based on the political environment they inhabit. When a situation is "hostile," countries have strong incentives to respond to military exercises, since concerns about

intentions may be strong.[20] While they may respond politically, countries in this environment have added incentives to respond aggressively with military action[21] in the form of reciprocal military exercises or actual military maneuvers. When the political situation is "non-hostile," countries are more likely to respond to military exercises with political actions.[22]

The political environment works through two mechanisms—the incentives it creates to respond to military exercises and the apparatuses that allow responses between states. When a relationship is non-hostile, the incentive may exist to maintain the political relationship, even in the face of threatening military exercises. In a non-hostile environment, states may also have the stable political relationship to address the concerns raised by military exercises in a political forum.[23] When a relationship is hostile, however, a state is more likely to respond with military force (although political responses occur as well), because the threat posed by military or political belligerency outweighs the incentives to repair the political relationship.[24]

Although military exercises may have influenced the political environment in the past and may influence it in the future (by creating hostile relations or by increasing cooperation through exercises), these mechanisms are externally created through the execution of a military exercise. The combatant commander does not control the political environment when planning a military exercise.

To code the political environment, we use a rough measure of provocative acts and positive overtures in the previous year, from the perspective of countries participating in an exercise and

[20] Jervis, Lebow, and Stein, *Psychology and Deterrence*.
[21] Charles L. Glaser, "The Security Dilemma Revisited," *World Politics* 50, no. 1 (October 1997): 171-201.
[22] See "Appendix C: Overview of the Bush School Military Exercise Dataset."
[23] Rose McDermott, Jonathan A. Cowden, and Stephen Rosen, "The role of hostile communications in a crisis simulation game," *Peace And Conflict: Journal Of Peace Psychology* 14, no. 2: 151-167.
[24] Ibid.

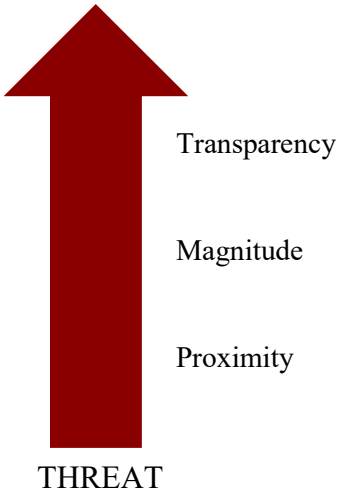
the adversarial country of interest.[25] Because this study focuses on the risk created by military threats, we prioritize the military relationship when looking at the political environment. We count negative and provocative actions, including changes in force basing, shows of force, military invasions, skirmishes, and conflict, as well as positive overtures like mil-to-mil cooperation. As a secondary consideration, we also examine both hostile and positive political acts, such as levying or removing sanctions, ousting or strengthening the relationship between political figures and international organizations, and suspending or joining treaties. This allows us to determine when a political relationship is hostile and when it is non-hostile.

Of course, within the political realm there is great gradation—the political environment is rarely clearly definable as "hostile" or "non-hostile." In some cases, the political relationship between two countries has transitioned frequently; in others, the political relationship has remained consistent over time. Since the end of the Cold War, the U.S. relationship with Russia has oscillated between non-hostility, including the Russian 'reset,' and hostility, such as the annexation of Crimea.[26] Often within a country dyad there are hostile issue areas and non-hostile issue areas. For example, while the U.S. has been able to cooperate with China on trade, there is great security competition in other arenas.[27] This study examines the political environment across interest areas.[28]

[25] See "Appendix A: Variable Explanations" for exact coding rules.
[26] Jim Nichol, *Russian Political, Economic, and Security Issues and U.S. Interests* (CRS Report No. RL33407), (Washington, DC: Congressional Research Service, 2014), http://www.fas.org/sgp/crs/row/RL33407.pdf, 49-60.
[27] Wayne M. Morrison, *China-U.S. Trade Issues* (CRS Report No. RL33536), (Washington, DC: Congressional Research Service, 2015), https://www.fas.org/sgp/crs/row/RL33536.pdf, 1-3.
[28] See "Appendix A: Variable Explanations" for exact coding rules.

Threat Level of the Exercise

The second determinant of the risks a military exercise may create is the perceived level of threat of the military exercise to the adversary. Because military exercises can signal hostile intentions and motives, they may appear threatening to adversaries. The threat level of an exercise is determined by three factors—the proximity of the exercise, the magnitude of the exercise, and the transparency of the exercise. By combining these three factors, a combatant commander can determine the perceived threat level of a military exercise. Within the bounds of set policy, a combatant commander can reduce this threat level by calibrating military exercises along these three variables.



Proximity.

Proximity is one of the most important determinants of the threat level of an exercise because it may signal a clear adversarial target and because military exercises can mask troop movements in the lead up to an invasion.[29] For the country running an exercise, operating in theater allows for realistic training. However, exercises held along an adversary's border, in its border region, or in its areas of interest are also highly threatening to the adversary because they could pose an immediate or future threat.[30] Exercises held at great distances are less threatening, as they do not present a direct military threat, but may present a future threat as military capabilities are

[29] Betts, *Surprise Attack*.
[30] Ibid.

built.[31] (Military exercises involving nuclear, cyber, or space create a special case of close proximity, even when held at great distances, as discussed below.)

Magnitude.

Because military exercises build capabilities that can be used in future conflicts and can signal a country's beliefs about the likelihood of upcoming conflicts, magnitude is equally important in determining the perceived threat level of the exercise. Large military exercises can appear threatening, even when held at a distance, because they can be used to build capabilities for future conflicts. Large military exercises held in border regions are particularly threatening, as they can mask an invasion force, which creates incentives for adversaries to respond.[32]

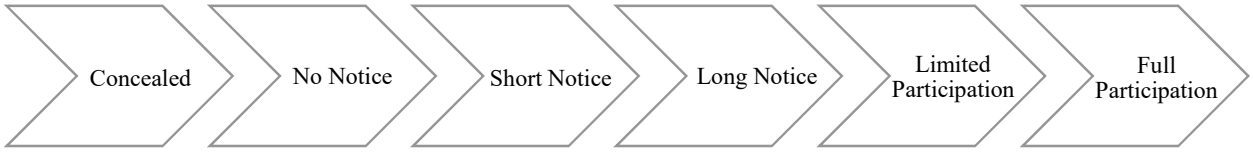
Because certain types of military forces may be considered more threatening to an adversary's security, magnitude is calculated as a composite variable consisting of force size, percentage increase between repeated iterations of an exercise, and force mix, when information is available.[33]

Transparency.

The third determinant of the perceived threat level of an exercise is the level of transparency. Because military exercises can be mistaken for actual military maneuvers, transparency plays an important role in mitigating the threat level of exercises. Transparency

[31] See "Appendix A: Variable Explanations" for coding rules.
[32] Betts, *Surprise Attack*.
[33] See "Appendix A: Variable Explanations" for coding rules.

within military exercises ranges from non-transparent, concealed exercises to highly transparent exercises with adversarial participation:[34]



While the U.S. and NATO traditionally offer long notice of military exercises and usually invite the adversary to observe, as required by the Organization for Security and Co-operation in Europe (OSCE) Vienna Document, other countries are not as open.[35] Since 2014, Russia has routinely run snap exercises without giving any notice.[36] Given Russia's history of using military exercises as a cover for invasions, these snap exercises are highly threatening.[37] When transparency is not offered, the threat level of an exercise increases significantly. When standard notice is offered, only adversarial observer status and participation can lower the threat level of an exercise.

Special Cases: Nuclear, Cyber, Space

Although proximity, magnitude, and transparency capture the threat level of nearly all military exercises, three special cases exist—nuclear, cyber, and space—that can also influence the threat level of an exercise.

[34] See "Appendix A: Variable Explanations" for coding rules.
[35] "Statement by NATO Deputy Spokesperson Carmen Romero on NATO military exercises," *NATO*, August 12, 2015, http://www.nato.int/cps/en/natohq/news_122048.htm.
[36] Martin Hurt, "Preempting Further Russian Aggression Against Europe," in *2016 Index of U.S. Military Strength: Assessing America's Ability to Provide for the Common Defense,* ed. Dakota L. Wood (Washington DC: *Heritage Foundation*, 2016), 37-42.
[37] Pavel Felgenhauer, "Sudden Massive Snap Exercise and Mobilization of Russian Forces in Black Sea and Caspian Region Appears Aimed at Turkey," *Jamestown Foundation: Eurasia Daily Monitor* 11, no. 29, February 11, 2016, http://www.jamestown.org/programs/edm/single/?tx_ttnews[tt_news]=45088.

Given the potentially catastrophic damage possible with nuclear weapons, the inclusion of nuclear weapons, even if only in a command post exercise, potentially raises the perceived threat of a military exercise.[38] This increases the risks an exercise might create. In 1983, NATO ran a nuclear command post exercise called Able Archer. Although the command post annex involved only a few hundred personnel, the Soviet Union responded by putting its conventional and nuclear forces on alert.[39] Presently, Russia also runs frequent military exercises involving nuclear forces, including an exercise that simulated dropping nuclear weapons on Sweden.[40] Since nuclear exercises highlight how a country may intend to use its nuclear forces and can serve as a means of testing nuclear strategies, nuclear exercises can appear threatening, even when an attack is not immediately anticipated.[41]

Although the risks created by cyber and space annexes lie beyond the scope of this paper, military exercises involving these tools may create additional risks.[42] Because cyber and space military exercises could have high destructive power[43] and can signal hostile intentions,[44] they likely increase the risks of a military exercise.

Ultimately, the inclusion of nuclear, cyber, or space annexes in a military exercise can increase the threat level of an exercise, beyond the proximity, magnitude, and transparency rankings.

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[38] Thomas C. Schelling, *Arms and Influence* (Santa Barbara: Praeger, 1977).
[39] Jones, Blanton, and Harper, "The 1983 War Scare Declassified and For Real."
[40] Rosen, "NATO report: A 2013 Russian aerial exercise."
[41] James T. Quinlivan, "Yes, Russia's Military Is Getting More Aggressive," *Foreign Policy*, December 30, 2014, http://foreignpolicy.com/2014/12/30/yes-russias-military-is-getting-more-aggressive/.
[42] See "Recommendations: Further Research" for additional details.
[43] Richard J. Campbell, *Cybersecurity Issues for the Bulk Power System* (CRS Report No. R43989), (Washington DC: Congressional Research Service, 2015), 22-25, https://www.fas.org/sgp/crs/misc/R43989.pdf.
[44] Jervis, Lebow, and Stein, *Psychology and Deterrence*, 14.

Risk Matrix

Together, we combine these two factors—the political environment and the threat level of the exercise—to create a Risk Matrix. This Risk Matrix shows the different levels of risk a military exercise is likely to run, based on the political environment within which the exercise takes place and the adversary-perceived threat level it creates. In each environment and at different levels of threat, different risks exist—ranging from accidents to crises. By understanding these two factors, a combatant commander can use this Risk Matrix to better understand the risks a military exercise can create. The risks are discussed in detail below. Should the risks be deemed unacceptable, a combatant commander can take steps to mitigate the risks by changing the threat level of the military exercise, which could change the risks that an exercise may run. The Risk Matrix provides combatant commanders a tool to evaluate the risks a military exercise might create through adversary responses.

Risk Matrix

Threat Level	Non-Hostile	Hostile
High	Hostility	Crisis
Low	Accidents	Reciprocity

Political Environment

Within the Risk Matrix, exercises are first divided by the political environment. Accidents and hostility are the highest risks an exercise in a non-hostile environment is likely to create. Exercises in a hostile environment may lead to crisis or reciprocity. Exercises which present a medium-high threat to the adversary or higher falls in the upper category—risking hostility or crisis, depending on the political environment. Any exercise that presents a medium threat or lower falls into the lower half of the Risk Matrix—risking accidents or reciprocity.

The Risk Matrix shows the highest risk that a military exercise is likely to create, based on the factors discussed above. But within each environment, a military exercise may also face

additional, lower level risks. For example, a highly threatening military exercise in a hostile political environment can risk a crisis. But it can also risk reciprocity, hostility, and accidents. This is because adversaries have different incentives for responding to military exercises.

Our Risk Matrix does not offer to explain the unique causal mechanisms behind every adversary's response; rather, it broadly identifies the risks an exercise is likely to run based on the deterministic factors of adversary behavior which a combatant commander is likely to know—the political environment—and is able to influence—the threat level of the exercise. Although factors within an adversarial state may influence its decision to respond to a threatening exercise, including military capabilities and political objectives in other areas, the Risk Matrix creates a baseline for a combatant commander to evaluate and address risk.

Although each military exercises has the *potential* for realizing a risk, not every exercise does. In fact, the Bush School Military Exercise Dataset shows that while reciprocity is common, accidents, hostility, and crises are relatively rare occurrences.[45] This is in part because countries often take care to reduce the risks of accidents and because changes to the political environment and military responses to military exercises are highly costly actions. Despite the high threat of a military exercise, an adversary may choose not to respond with such risky actions. All four risks deserve examination despite the rarity of occurrences, however, as the potential consequences can be severe.

By analyzing the political environment in which the exercise is occurring and calculating the threat level of an exercise using proximity, magnitude, and transparency, a combatant commander can determine which risks an exercise may to create. If the risks are deemed too high, a combatant commander can mitigate these risks by calibrating the threat level of the exercise—

[45] See "Appendix C: Overview of the Bush School Military Exercises Dataset"

the proximity, magnitude, or transparency. Depending on the nature of the mission, whether it is vital to exercise a large force to test command and control or to run exercises in a specific area close to the conditions in which a force might someday face combat, mitigation may be possible. In others, risk mitigation may not be possible without altering the mission of an exercise. In either case, the Risk Matrix allows a combatant commander to make a better cost-benefit analysis, recognizing that military exercises may create the potential for everything from accidents to actual crises.

The Dangers of Military Exercises

As our framework shows, in our examination of exercises spanning fifty years, we find that adversaries respond to military exercises in ways that create four key risks (in ascending order of consequence)—accidents, hostility, reciprocity, and crises.

Through our examination of historical cases and relevant literature, we found misperception of intentions and motives underlies each of the risks created by military exercises. Military exercises create the potential for risks, because countries can never be sure of the motives or intentions of another country.[46] This means that a country running an exercise may misperceive the intentions or motives of a potential adversary or the incentives an adversary has to react to a military exercise. An adversarial country may have incentives to respond to threatening exercises, either because they cannot determine the motives or intentions behind a military exercise or because they do understand the motives and intentions and have incentives to respond. Misperception, miscalculation, and accurate intelligence can all create incentives for adversaries to respond to military exercises. These adversarial responses create risks.

[46] Jervis, Lebow, and Stein, *Psychology and Deterrence*.

Particularly in adversarial relationships, military exercises can create misperception, as countries are already operating under hostile assumptions.[47] Even when military exercises focus on relatively non-threatening missions such as anti-piracy, or are not directed at a specific country, an adversary may perceive a threat, regardless of whether or not hostile intentions or motives exist.[48] This complicates planning for a combatant commander, as statements about the harmonious intent of a military exercise or its narrow focus may have little effect on the perceptions of that exercise to an adversary.

Accidents

As with any military maneuvers, the use of personnel and equipment during military exercises can lead to accidents. Many countries run provocative military exercises near other countries' borders, which creates the potential for an accident in a potential adversary's territory. Between 2014 and 2015, Russia and NATO countries experienced over 60 close military encounters that nearly resulted in accidents, many of which occurred in the context of military exercises.[49] Adversarial countries also sometimes send surveillance equipment to survey other countries' exercises. In 2014, Chinese ships spied on a U.S. exercise involving 18,000 personnel.[50] These incidents creates the potential for mid-air collisions or other military-to-military incidents. These accidents are particularly dangerous in the context of military exercises because they can

[47] Ibid.
[48] Jervis, *Perception and Misperception*, 121.
[49] Thomas Frear, "List of Close Military Encounters Between Russia and the West, March 2014-2015" *European Leadership Network*, March 2015, http://www.europeanleadershipnetwork.org/medialibrary/2015/03/11/4264a5a6/ELN%20Russia%20-%20West%20Full%20List%20of%20Incidents.pdf.
[50] Erik Slavin, "Chinese Ship Spies on Valiant Shield, and That's OK With US," *Stars and Stripes*, September 22, 2014, http://www.stripes.com/news/pacific/chinese-ship-spies-on-valiant-shield-and-that-s-ok-with-us-1.304288.

lead to loss of life and destruction of military equipment. An adversary or the country running the exercise may interpret these actions as deliberate.[51] Even if an incident is recognized as an accident, other issues, like territorial violations, may make resolving a potential accident situation difficult to resolve.[52]

Hostility

Military exercises can also negatively impact the political environment and create hostility. Because adversaries may perceive an exercise to signal hostile intentions or motives, they can respond in ways that increase tensions and negatively affect the political environment. In 2012, NATO ran a large military exercise, Cold Response 2012, in Northern Norway near the Barents Sea.[53] Despite a relatively non-hostile relationship, Russia found the NATO exercise extremely provocative and issued numerous public statements condemning the action.[54] Although the NATO exercise was relatively non-threatening, Russia considered the act hostile and the political relationship suffered.[55] This potential for misperceptions between the country running the exercise and the adversary can create risks for a combatant commander. A military exercise may have negative repercussions that lead to political tensions between the two countries.

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[51] Ian Kearns, "Avoiding War in Europe: The Risks from NATO-Russian Close Military Encounters," *Arms Control Association*, November 2, 2015, https://www.armscontrol.org/ACT/2015_11/Features/Avoiding-War-in-Europe-The-Risks-from-NATO-Russian-Close-Military-Encounters.

[52] Although outside of the context of a military exercise, U.S. servicemen and women were held for nearly two weeks in China, following the 2001 mid-air collision of a U.S. plane and Chinese jet. Shirley A. Kan et al., *China-U.S. Aircraft Collision Incident of April 2001: Assessments and Policy Implications* (CRS Report No. RL30946), (Washington, DC: Congressional Research Service, 2001), 1, https://www.fas.org/sgp/crs/row/RL30946.pdf.

[53] Trude Pettersen, "15 nations take part in military exercise in Norway," *Barents Observer*, March 5, 2012, http://barentsobserver.com/en/topics/15-nations-take-part-military-exercise-norway.

[54] Trude Petterson, "Russian military experts: NATO exercise in Norway a provocation," *Barents Observer*, March 14, 2012, http://barentsobserver.com/en/additional-menu/russian-military-experts-nato-exercise-norway-provocation.

[55] Ibid.

Reciprocity

Military exercises can also cause reciprocal responses, also called tit-for-tat exercises. Adversaries may respond to a country's military exercise with a military exercise of their own of equal or greater size. This not only increases tensions between the countries; it can also lead to increased military competition as both sides have an incentive to respond with larger, more threatening military exercises.[56]

Reciprocal exercises create danger in three key ways. First, in an environment of increased competition, the likelihood of misperception increases. Political hostility and high threat exercises may mask motives and intentions.[57] Second, reciprocity can lead to unintended military competition, which can be difficult to halt and which may create insecurity.[58] Potential adversaries may respond to this insecurity in ways that further destabilizes the situation militarily. This type of environment can also drain resources, incentivizing a combatant commander's to respond with large, resource intensive exercises.

Third, reciprocity can lead to instability, as the frequency and magnitude of military exercises increases. Incentives may exist for countries to run more threatening exercises. Countries may increase the magnitude of an exercise and the proximity to the potential adversary's border. Additionally, in a reciprocal environment, a country may feel incentivized to respond to a military exercise with snap exercises, in which no notice of the exercise is given. Such exercises create additional risks, because they are non-transparent.

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[56] Brzezinksi and Varangis, "The NATO-Russia Exercise Gap."
[57] Jervis, *Perception and Misperception in International Politics*.
[58] In addition to an increase in military exercises in Europe, since 2014 there has been a marked increase in the number of close military encounters between NATO countries and Russia, including 400 interceptions of Russian warplanes and narrowly avoided collisions between Russian planes and commercial airliners. See Ian Kearns, Lukasz Kulesa, and Thomas Frear, "Russia – Dangerous Brinkmanship Continues," *European Leadership Network*, March 12 2015, http://www.europeanleadershipnetwork.org/russia--west-dangerous-brinkmanship-continues-_2529.html.

Ultimately, reciprocity can increase the potential for military competition and escalation. This is especially troubling for a combatant commander when it creates an environment in which an adversary frequently mobilizes troops in threatening ways, with little notice or accountability. Because such exercises may mimic or mask invasion forces, reciprocal military exercises can contribute to the fourth risk—crisis.[59]

Crisis

Lastly, and most alarming, military exercises may create crisis situations. Because military exercises can signal hostile intentions and motives[60] and can mask invasion movements,[61] an adversarial country has an incentive to respond to threatening military exercises in a forceful manner if they perceive a real threat or a potential gain from their response. This threat is most acute when the political relationship is already strained or openly hostile.[62] In the past fifty years, military exercises have led potential adversaries to put their military forces on alert or to respond to threatening exercises near border regions by mobilizing troops.[63] In some cases, these actions resulted in border skirmishes.[64] In the extreme, military exercises could potentially contribute to the start of a war.

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[59] Betts, *Surprise Attack*, 205-206.
[60] Jervis, Lebow, and Stein, *Psychology and Deterrence*, 1.
[61] Betts, *Surprise Attack*, 205-206.
[62] Jervis, *Perception and Misperception in International Politics*.
[63] In 1983, Russian conventional and nuclear forces were placed on alert following a NATO command post nuclear exercise. See Nate Jones, Tom Blanton, and Lauren Harper, eds., "The 1983 War Scare Declassified and For Real," in *National Security Archive Electronic Briefing Book No. 533* (Washington D.C.: George Washington University, 2015), http://nsarchive.gwu.edu/nukevault/ebb533-The-Able-Archer-War-Scare-Declassified-PFIAB-Report-Released/.
[64] In 1986, Pakistan responded to India's threatening Exercise Brasstacks by moving troops to the border. Eventually skirmishes broke out between the two countries. See Kanti P. Bajpai, *Brasstacks and Beyond: Perception and Management of Crisis in South Asia* (New Dehli: Manohar, 1997), 170-174.

The threat of crises is twofold. Crises can arise out of misperception. If an adversary believes that a military exercise threatens its security or interests the adversary has an incentive to respond, even if the exercise is not intended to signal such intentions.[65] Crises can also occur because of cost-benefit analyses of potential future conflict. Military exercises may build capabilities for future wars against a specific adversary and can send specific deterrence messages to an adversary. A potential adversary watching a military modernization program may have incentives to react now, rather than later, if they believe that such actions are necessary for their interests.[66] This distinction is important for U.S. combatant commanders when considering military exercises in the future. Regardless of how accurately an adversary interprets the intent or motives behind a military exercise, they may still react in ways that create unintended consequences.

Escalation

While accidents, hostility, reciprocity, and crises present their own dangers, military exercises can also create risks because the effects of military exercises can combine, leading to escalation. As a country responds to a military exercise, the potential adversary may also have an incentive to respond in more dangerous ways. These countries may become trapped in negative spirals of hostility and reciprocity. Under these conditions, the potential for a crisis increases. The current level of increasingly large, frequent military exercises in Europe reflects these dangers. When planning military exercises, a combatant commander must consider the broader implications of military exercises, as they do not occur in a vacuum.

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[65] Jervis, Lebow, and Stein, *Psychology and Deterrence*.
[66] Richard Ned Lebow, "Windows of Opportunity: Do States Jump Through Them?" *International Security* 9, no. 1 (1984), 181-186.

The increasing tempo of NATO and Russian military exercises in Europe illustrates how the risks of a singular military exercise can combine. For the past decade, NATO-Russia relations have been on a volatile, negative trajectory. In recent years, the situation has only worsened.[67] As the political environment has deteriorated, military competition between Russia and the West has entered an increasingly dangerous spiral of reciprocity.[68] As "Figure 1" shows, the frequency of NATO and Russian exercises has increased in the past two years. To reassure allies in Europe, NATO performed 162 exercise events in 2014 and participated in 40 national exercises in the region.[69] This was double the originally planned exercises.[70] NATO further increased its involvement in Europe in 2015, conducting and participating in nearly 300 military exercises.[71] By comparison, Russia's Ministry of Defense planned 4,000 military events in 2015.[72] As Figure 2 shows, the magnitude and intensity of Russia's military exercises has also increased at an alarming rate. Russia has held more than 18 large-scale, snap exercises in the past three

Figure 1: Increasing Frequency
Data Source: Brzezinksi and Varangis, "The NATO-Russia Exercise Gap"

[67] At the end of 2012, Russia expelled the U.S. Agency for International Development (USAID). See Natasha Abbakumova and Kathy Lally, "Russia boots out USAID," *The Washington Post*, September 18, 2012, https://www.washingtonpost.com/world/russia-boots-out-usaid/2012/09/18/c2d185a8-01bc-11e2-b260-32f4a8db9b7e_story.html. Russia also harbored Edward Snowden and supported the Syrian regime of President Bashar al-Assad, both against U.S. wishes. The U.S.-Russian relationship hit its nadir with the Russian invasion and subsequent annexation of Crimea and the continuing crisis in Ukraine. See John Simpson, "Russia's Crimea plan detailed, secret and successful," *BBC News*, Macrh 19, 2014, http://www.bbc.com/news/world-europe-26644082.
[68] See Brzezinksi and Varangis, "The NATO-Russia Exercise Gap" and "Appendix C: Overview of the Bush School Database."
[69] NATO, *The Secretary General's Annual Report,* 2014.
[70] Ibid.
[71] Ibid
[72] See Bodner. "Russia Launches Largest Military Maneuvers of 2015" and Frear, Kearns, and Kulesa, "Preparing for the Worst."

years.[73] Some included more than 100,000 personnel. Many of these large scale snap exercises occurred close to the border, creating the potential for risky NATO responses. Additionally, since Russia has used these types of military maneuvers in the past to mask invasion, these exercises are especially concerning.[74] Several Russian exercises have also included nuclear components, which creates additional danger.[75] In the complex European theater, political action, reciprocal military exercises, and military maneuvers all work to create incentives for increasingly risky responses.

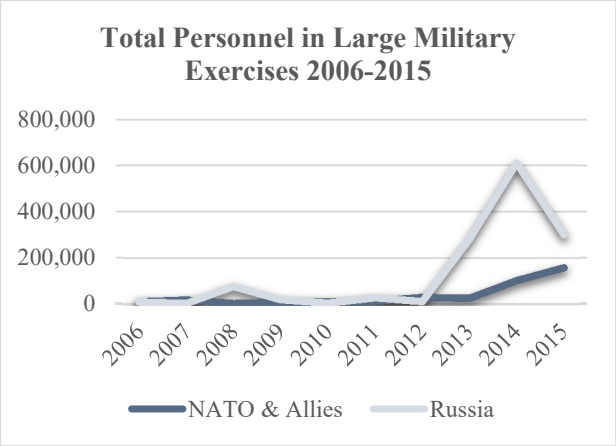


Figure 2: Increasing Magnitude
Data Source: The Bush School Military Exercises Dataset

As the current NATO-Russian exercise tempo shows, while singular military exercises create risk, the combined effects of military exercises can compounded dangers. Reciprocal responses to military exercises creates a particularly dangerous situation. As the political situation becomes more hostile, exercises appear more threatening, and countries have greater incentives to react in risky ways, which may lead to crises in the future.

Historical Case Studies

To test the plausibility and utility of our analytical framework, we selected several military exercises from the Bush School Military Exercise Dataset. By analyzing historical case studies on

[73] NATO, *The Secretary General's Annual Report*, 2015.
[74] Russia has been accused of using exercises to mask invasions into Georgia (2008) and Crimea (2014). See Whitmore, "Did Russia Plan Its War In Georgia?" and Brzezinksi and Varangis, "The NATO-Russia Exercise Gap."
[75] Armin Rosen, "NATO report: A 2013 Russian aerial exercise was actually a 'simulated nuclear attack' on Sweden," *Business Insider*, February 3, 2016, http://www.businessinsider.com/nato-report-russia-sweden-nuclear-2016-2.

exercises that resulted in unanticipated consequences, we are able to test our analytical framework and highlight the causal mechanisms by which military exercises create risk. These cases further show how a combatant commander might utilize our Risk Matrix to evaluate and reduce risk. These historical case studies illustrate the risks military exercises create, highlight the credibility of our analytical framework, and provide an avenue to discuss risk mitigation strategies for a combatant commander.

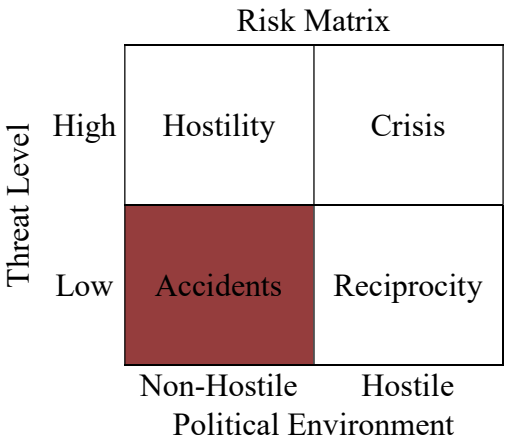
This selection of case studies is not meant to be representative or exhaustive. Of the 200 cases in the Bush School Military Exercise Dataset, we selected eight military exercises for in-depth case studies. We chose these cases because they resulted in a negative outcome. By selecting on the extremes, we clearly show how military exercises created and contributed to risk. Additional case studies are included in "Appendix B: Additional Case Studies" and a broader selection of military exercises may be found in "Appendix C: Overview of the Bush School Military Exercise Dataset." Additionally, while our Risk Matrix identifies the risks that a military exercise could run, the particular circumstances that lead to risk realization will differ from case to case. Our historical case studies show that while these circumstances matter, the political environment and the exercise threat level captured in our analytical framework accurately predicts the risks military exercises can create.

A*ccident: Hainan Island Incident, 2001*

In 2001, a Chinese spy plane and a U.S. surveillance plane collided in mid-air near Hainan Island, China, when a People's Liberation Army (PLA) fighter pilot executed a close pass of the U.S. EP-3

Hainan Island Incident	**Ranking**
Political Environment	Non-hostile
Proximity	High
Magnitude	Low
Transparency	Low
Composite Threat Score	Medium
Predicted Risk	Accidents
Outcome	None

reconnaissance plane.[76] Although the Hainan Island incident occurred outside of the bounds of a military exercise, the case highlights the potential for accidents and the possible repercussion between a country and an adversary. A similar scenario, under the auspices of a military exercise, could be even more dangerous, because military exercises can simulate wartime conditions.



Based on the political environment at the time and the threat level of the exercise, the Hainan Island incident would have risked an accident, had it occurred during an exercise. At the time of the incident, relations between China and the U.S. were non-hostile, although the U.S. was in the process of a U.S.-Taiwanese arms sale.[77] The proximity of the exercise was high, as it occurred in near China. However, the magnitude was low, involving only one Chinese jet and one U.S. reconnaissance plane.[78]

Despite the relatively low threat of the incident, China reacted very strongly—holding the EP-3 crew for 11 days. The U.S. was forced to apologize in the aftermath, while China demanded an end to U.S. spy flights off its coast.[79] At that point, both the U.S. and China worked to reduce tensions.[80]

While the Hainan Island incident in 2001 occurred outside of the context of an exercise, the incident shows how an accident could happen and how the adversarial response could create

[76] Kan, et al., "China-U.S. Aircraft Collision."
[77] Elisabeth Rosenthal and David E. Sanger, U.S. Plane in China After It Collides with Chinese Jet," *New York Times*, April 2, 2001, http://www.nytimes.com/2001/04/02/world/us-plane-in-china-after-it-collides-with-chinese-jet.html?pagewanted=all.
[78] Ibid.
[79] Paul Eckert, "Dismantled U.S. spy plane flown out of China," *ABC News*, July 3, 2001, http://abcnews.go.com/International/story?id=80826&page=1.
[80] Ibid.

additional repercussions. Given that an exercise might involve a much higher threat activity and could take place in a hostile political environment, military planners must be cognizant that accidents are always possible, either caused by adversary responses or through personnel and equipment errors. Recent provocations and unsafe maneuvers during U.S. and NATO exercises by Russia in the Baltic Sea and China in the Pacific highlight this risk.[81]

Hostility: Steadfast Jazz 2013

In 2013, NATO ran Steadfast Jazz, one of the largest military exercises since the end of the Cold War, along Russia's border.[84] The high threat exercise created hostility and contributed to a negative downturn in the political relationship between the U.S. and Russia.

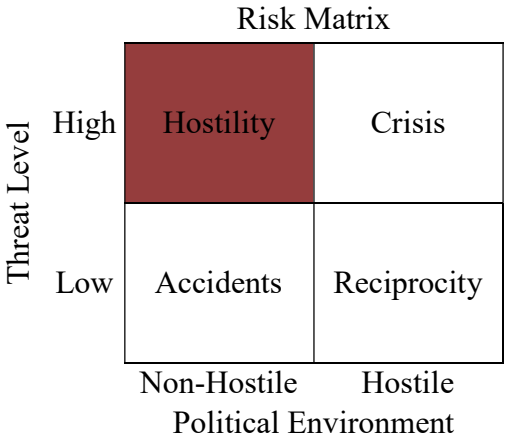
Steadfast Jazz 2013	**Ranking[82]**
Political Environment	Non-hostile[83]
Proximity	High
Magnitude	Medium-High
Transparency	Medium
Composite Threat Score	Medium-High
Predicted Risk	Hostility
Outcome	Hostility

When Steadfast Jazz 2013 was announced in 2011 under NATO's traditional two year notice of military exercises, the political environment between the U.S. and Russia was non-hostile. Although the 2008 Russo-Georgian War had briefly turned relations hostile, the Obama administration presided over a "Russian reset" in 2009.[85] The U.S. and Russia had significant issue cooperation on counter-terrorism, which included Russia allowing NATO to supply troops in

[81] See Erik Slavin, "Chinese ship spies on Valient Shield - and that's OK with US," *Stars and Stripes*, September 22, 2014, http://www.stripes.com/news/pacific/chinese-ship-spies-on-valiant-shield-and-that-s-ok-with-us-1.304288. See Frear, "List of Close Military Encounters."
[82] See the "Bush School Military Exercises Dataset" for specific coding.
[83] The relationship was non-hostile when the exercise was announced. This changed in 2013. See "Appendix A: Variable Explanations" for further details on the political environment.
[84] "NATO's Steadfast Jazz exercise gets underway," *North Atlantic Treaty Organization*, November 2, 2013, http://www.nato.int/cps/en/natolive/news_104648.htm.
[85] Maxwell Tani, "Hillary Clinton just made two statements to boost her foreign policy credentials - and one is iffy," *Business Insider*, June 14, 2015, http://www.businessinsider.com/hillary-clinton--russia-and-the-reset-2015-6.

Afghanistan through the Northern Distribution Network (NDN).[86] The two countries had also recently run a joint anti-hijacking exercise[87] and signed the New START treaty on nuclear arms control.[88] Discussions on joint sanctions against Iran were also underway.[89] Although there were areas of contention, the relationship was non-hostile when NATO announced Steadfast Jazz 2013. In 2012, after Steadfast Jazz 2013's announcement, the relationship began to deteriorate. Russia began air zone incursions on nearby countries, including NATO partners.[90] President Obama signed the Magnitsky Act, which targeted human rights abusers in Russia.[91] In response, Putin signed a bill to ban U.S. citizens from adopting Russian children.[92] In the midst of the worsening relationship, NATO held Steadfast Jazz 2013.

Steadfast Jazz 2013 was a medium-high threat exercise. During the exercise, NATO and partner countries exercised forces in Poland and the Baltic states, all within a short distance of the Russian border.[93] Over 6,000 personnel took part in the exercise, which tested the NATO Response Force (NRF).[94] NRF's



[86] Andrew Kuchins and Tom Sanderson, "Northern Distribution Network," *Center for Strategic & International Studies,* http://csis.org/program/northern-distribution-network-ndn.
[87] "Vigilant Eagle 2010- protection against aircraft terrorism," *Sputnik News*, August 14, 2010, http://sputniknews.com/voiceofrussia/2010/08/14/15771719.html.
[88] "New START," *U.S. Department of State*, April 21, 2016, http://www.state.gov/t/avc/newstart/index.htm.
[89] "Citing Iran's failure to clarify nuclear ambitions, UN imposes additional sanctions," *United Nations News Centre*, June 9, 2010, http://www.un.org/apps/news/story.asp?NewsID=34970.
[90] Bill Gertz, "False START," *The Washington Free Beacon*, July 19, 2012, http://freebeacon.com/national-security/false-start/.
[91] "Russia and Moldova Jackson-Vanik Repeal and Sergei Magnitsky Rule of Accountability Act of 2012," US Treasury, December 14, 2012, https://www.treasury.gov/resource-center/sanctions/Programs/Documents/pl112_208.pdf.
[92] David M. Herszenhorn and Erik Eckholm, "Putin Signs Bill that Bars U.S. Adoptions, Upending Families," *The New York Times*, December 27, 2012, http://www.nytimes.com/2012/12/28/world/europe/putin-to-sign-ban-on-us-adoptions-of-russian-children.html?_r=0.
[93] "NATO's Steadfast Jazz exercise gets underway."
[94] Ibid.

mission is specifically to respond to Article V aggression, which led some to believe the exercise was targeted at Russia.[95] Standard two year notification was given, but Russia did not participate in the exercise. Based on the location, magnitude, and transparency, Steadfast Jazz 2013 was threatening to Russia.

Because of the non-hostile political environment at the time the exercise was announced and the high threat nature of the exercise, Steadfast Jazz risked hostility. In response to Steadfast Jazz 2013, Russia heavily protested the exercise. A defense ministry accusing the exercise of "having the chill of the Cold War."[96] Although determining whether an exercise contributes to a hostile turn of relations or is a leading indicator of such a turn is difficult, the official Russian protests of the exercise make it clear that Steadfast Jazz increased hostility between the U.S. and Russia.

If a combatant commander wished to mitigate the risk of Steadfast Jazz 2013 creating hostility, he or she could have done several things differently. The force could have been exercised outside of Russia's border regions to reduce the perceived threat of the exercise. NATO's Trident Juncture 2015 had a significantly greater magnitude, but was held at a distance in Spain and Portugal.[97] To lower the magnitude of the exercise, forces could have been exercised at different times. Finally, Russian participation would have increased transparency and might have decreased the risk, though such an action may have been unfeasible due to operational secrecy.

Ultimately, Steadfast Jazz 2013 contributed to a negative downturn in the political relationship between the U.S. and Russia, as evidenced by the worsening relationship between the

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[95] Ibid.

[96] Andrei Akulov, "NATO Steadfast Jazz Exercise - Chill of Cold War," *Strategic Culture Foundation Online Journal*, October 17, 2013, http://www.strategic-culture.org/news/2013/10/17/nato-steadfast-jazz-exercise-chill-of-cold-war.html.

[97] Nicholas Fiorenza, "NATO's Trident Juncture Exercise Ends on Positive Note," Aviation Week Network, November 6, 2015, http://aviationweek.com/blog/natos-trident-juncture-exercise-ends-positive-note.

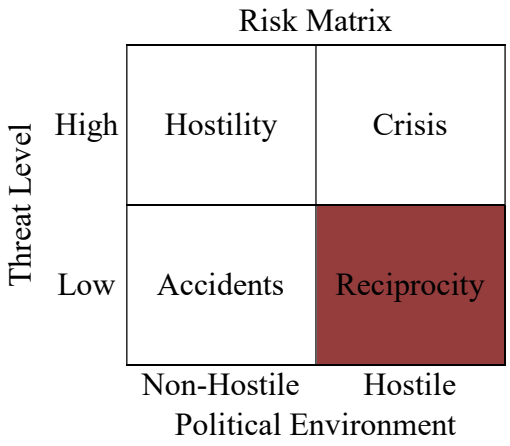
announcement of the exercise and its occurrence, as well as the hostile political statements given by the Russian government about the exercise. This exercise highlights that even in a non-hostile environment, hostility can occur if an exercise appears threatening.

Reciprocity: Immediate Response 2008

In 2008, the U.S. ran Immediate Response 2008, a counterterrorism exercise in Georgia that resulted in reciprocity. In response, Russia ran Kavkaz 2008, an exercise of even greater magnitude.[99] Immediate Response 2008 and the reciprocal Kavkaz 2008 demonstrate how military exercises can create spirals of reciprocity.

Immediate Response 2008	**Ranking** [98]
Political Environment	Hostile
Proximity	High
Magnitude	Medium
Transparency	Medium
Composite Threat Score	Medium
Predicted Risk	Reciprocity
Outcome	Reciprocity

In 2008, the political environment between the US and Russia was hostile. This hostile relationship began in 2003 with the accession of Latvia, Lithuania and Estonia into NATO. The relationship further deteriorated when Russia suspended its participation in the Treaty on Conventional Armed Forces in Europe (CFE) in 2007. Additionally, at the same time, Bulgaria and Romania joined the European Union (EU) and Georgia entered talks to become a NATO member. In response to NATO expansion, Russia threatened to recognize Georgia's autonomous regions, Abkhazia and South Ossetia, as an attempt to deter Georgia from pursuing NATO



[98] See the "Bush School Military Exercises Dataset" for specific coding.
[99] C. W. Blandy, "Provocation, Deception, Entrapment: The Russo-Georgian Five-Day War," *Advanced Research and Assessment Group*, March 2009, http://www.conflictstudies.org.uk/files/04.pdf .

membership. Throughout 2007 and 2008, Russia also strengthened trade ties with Georgia's autonomous regions and increased its peacekeeper presence in the area.[100]

In the midst of this hostile political relationship, the U.S. ran Immediate Response 2008 with Partnership for Peace (PfP) countries, including Georgia. In previous years, the exercise had been held in Bulgaria and Poland. The 2008 variant, held from July 15 to July 31, was run in Georgia, at a base approximately 30km east of Tbilisi. With 2,000 personnel operating both ground and air forces, the size of the exercise was moderately threatening, causing it to risk reciprocity.[102]

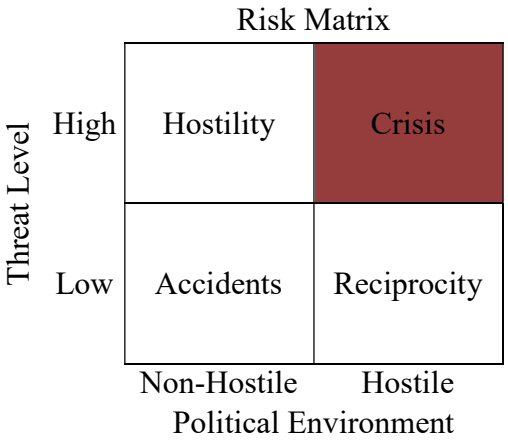
Kavkaz 2008	**Ranking[101]**
Political Environment	Hostile
Proximity	High
Magnitude	Medium-High
Transparency	Low
Composite Threat Score	High
Predicted Risk	Crisis
Outcome	Crisis

Although Immediate Response 2008 was only a moderately threatening exercise, it nonetheless elicited an aggressive Russian military exercise—Kavkaz 2008. Kavkaz 2008 was held in the Russo-Georgian border regions, and began on July 15—the same day as Immediate Response 2008.[103] The exercise officially consisted of 8,000 Russian troops, but with permanent readiness forces stationed in the Chechen region, the real force size was over 23,000 servicemen.[104] Kavkaz 2008 was comprised of both air and ground forces that spanned the entire Russo-Georgian border, with a focus on important mountain passes.[105] The exercise was planned on short notice and Russia did not invite international observers. [106] The large magnitude, close

[100] George Friedman, "The Russo-Georgian War and the Balance of Power," *Stratfor,* 12 August 2008, https://www.stratfor.com/weekly/russo_georgian_war_and_balance_power.
[101] See the "Bush School Military Exercises Dataset" for specific coding.
[102] David Mdzinarishvili, "US Troops Start Training Exercise in Georgia," *Reuters*, 15 July 2008, http://www.reuters.com/article/us-georgia-usa-exercises-idUSL1556589920080715.
[103] Blandy, "Provocation, Deception, Entrapment."
[104] Ibid.
[105] Ibid.
[106] Following Kavkaz 2008, Russia invaded South Ossetia, using troops that were in theater for the exercise, which highlights how military exercises can be used to mask troop movements. In contrast, Russia has claimed that the Georgians used Immediate Response as training for an immediate invasion of the South Ossetia region. See Pavel Felgenhauer, "Russian Military Chief Accuses Georgia of Preparing Aggression," *Jamestown Foundation*, 18 June 2009, http://www.jamestown.org/single/?tx_ttnews%5Btt_news%5D=35140&no_cache=1#.VyZYfTArLIU.

proximity, and lack of transparency made the exercise highly threatening. As a response to Immediate Response 2008, Kavkaz 2008 was disproportionally threatening, highlighting the dangers of reciprocity.

To mitigate the potential for reciprocity caused by Immediate Response 2008, a combatant commander could have held Immediate Response 2008 in another region. The Georgian situation was already deteriorating by the time of the exercise and previous iterations of the exercise had been conducted in other countries. By recognizing the hostile environment, a combatant commander *might* have been able to forestall a Russian response.[107]



Given the deteriorating political relationship between the U.S. and Russia and the very hostile Russo-Georgian relationship, Immediate Response was threatening, as it occurred in a border region where Russian troops were already stationed. Immediate Response 2008 and the reciprocal Kavkaz 2008 are prime examples of how an exercise can lead to increasingly dangerous responses from an adversary.

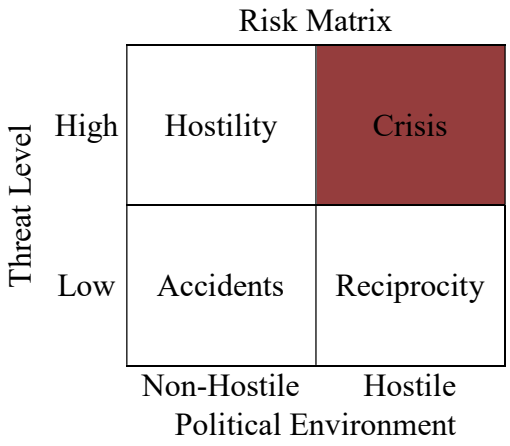
Crisis: Able Archer 1983

In 1983, NATO ran Able Archer, a command post nuclear exercise as part of its larger Autumn Forge

Able Archer 1983	**Ranking[108]**
Political Environment	Hostile
Proximity	High
Magnitude	High
Transparency	Low
Composite Threat Score	High
Predicted Risk	Crisis
Outcome	Crisis

[107] Ibid.
[108] See the "Bush School Military Exercises Dataset" for specific coding.

exercise.[109] In response to the nuclear exercise, the Soviet Union and Warsaw Pact members placed their nuclear and conventional forces on alert.[110] The situation was only resolved because NATO chose not to elevate its own alerts system and because both Russia and NATO took diplomatic actions.[111] This exercise highlights how a crisis can occur because of a military exercise.



The political relationship between NATO and Warsaw Pact members was extremely hostile prior to Able Archer. In March 1983, President Reagan had personally introduced the Strategic Defense Initiative (SDI), which Soviet leaders found highly threatening.[112] In late 1983, Soviet pilots accidentally shot down Korean Airlines Flight 007 over the Sea of Japan, killing 269 civilians.[113] At the same time, NATO also deployed a new generation of intermediate-range nuclear missiles (IRBM) in Western Europe, causing Soviet negotiators to walk out of arms control talks in Geneva.[114] And in the two months before Able Archer was held, the Soviet Union's nuclear warning system malfunctioned, detecting ICBM launches from the U.S., which turned out to be false.[115] When Able Archer began in November of 1983, the situation was hostile.

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[109] David E. Hoffman, "In 1983 'war scare,' Soviet leadership feared nuclear surprise attack by U.S.," *The Washington Post*, October 24, 2015, https://www.washingtonpost.com/world/national-security/in-1983-war-scare-soviet-leadership-feared-nuclear-surprise-attack-by-us/2015/10/24/15a289b4-7904-11e5-a958-d889faf561dc_story.html

[110] Jones, Blanton, and Harper, eds., "The 1983 War Scare Declassified"

[111] Ibid.

[112] Benjamin B. Fischer, "The Cold War Conundrum: The 1983 Soviet War Scare," *Central Intelligence Agency Center for the Study of Intelligence,* 2008, accessed May 1, 2016, https://www.cia.gov/library/center-for-the-study-of-intelligence/csi-publications/books-and-monographs/a-cold-war-conundrum/source.htm#HEADING1-12

[113] Ibid.

[114] Hoffman, "In 1983 'war scare,' Soviet leadership feared nuclear surprise attack by U.S."

[115] Jones, Blanton and Harper, "The 1983 War Scare Declassified and for Real."

In 1983, NATO ran its annual Autumn Forge exercise.[116] Roughly 80,000 troops participated, with all arms and headquarters integration.[117] As a yearly NATO exercise, Autumn Forge tested the U.S. and NATO's ability to defend the Fulda Gap and to reinforce the continent.[118] In the exercise, as U.S. follow on forces entered the theater, nuclear weapons were factored into the exercise, to prevent NATO forces from being overrun.[119] Additionally in 1983, the nuclear annex was changed to include high level participation by high level officials, including President R. Reagan. The exercise also used the communications equipment needed to release nuclear weapons in the event of a nuclear exchange.[120] Weapons facilities themselves also participated, with a simulated release of weapons.[121] The magnitude of Autumn Forge and the inclusion of nuclear weapons contributed to the high threat level of the exercise.

The location and transparency of the exercise were also very threatening. NATO and U.S. troops were practicing along the inner-German border, in areas where actual fighting was planned to take place in the event of hostilities.[122] While standard notification was given for the overarching Autumn Forge exercise, NATO forces left out key information on the expanded nuclear annex, increasing the potential for misunderstandings.[123] This proximity and lack of transparency in Able Archer, as well as the high threat posed by nuclear involvement made the exercise very threatening.

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[116] Douglas Birch, "The U.S.S.R. and U.S. Came Closer to Nuclear War Than We Thought," *The Atlantic*, May 28, 2013, http://www.theatlantic.com/international/archive/2013/05/the-ussr-and-us-came-closer-to-nuclear-war-than-we-thought/276290/

[117] Jamie Doward, "How a NATO war game took the world to brink of nuclear disaster," *The Guardian*, November 2, 2013, http://www.theguardian.com/uk-news/2013/nov/02/nato-war-game-nuclear-disaster

[118] Anne Applebaum, "Should NATO renew REFORGER exercises?" *Atlantic Council*, November 23, 2010, http://www.atlanticcouncil.org/blogs/natosource/should-nato-renew-reforger-exercises

[119] Hoffman, "In 1983 'war scare,' Soviet leadership feared nuclear surprise attack by U.S."

[120] Ibid.

[121] Ibid.

[122] "Reforger," *Global Security*, http://www.globalsecurity.org/military/ops/reforger.htm

[123] Birch, "The U.S.S.R. and U.S. Came Closer to Nuclear War Than We Thought."

Because of the hostile relationship and the very high threat exercise, Able Archer risked a crisis. In fact, the Soviet Union responded by putting air formations in East Germany and Poland on high alert.[124] Soviet nuclear forces were also readied, with ICBMs prepared for launch.[125] After the CIA reported nuclear preparations on the Soviet side, Reagan decided not to participate and cancelled the exercise, resolving the situation.[126]

To mitigate the potential risks of Able Archer, NATO could have taken steps to lower the threat level of the exercise or could have altered the timing of the exercise to seem less threatening. Increased transparency would have likely helped assuage Soviet fears of a NATO first strike. Likewise, separating the Able Archer exercise from the larger Autumn Forge exercise might have reduced the threat level, since the conventional forces bolstered fears of military action.[127] And lastly, NATO could have reduced risk by altering the timing of the exercise. In 1983, the NATO-Soviet relationship was particularly hostile. If NATO had waited several months, the threat level of the exercise may have been reduced.

Ultimately, because of the political environment and Able Archer's nuclear annex, as well as the magnitude, proximity, and transparency of the exercise and the overarching Autumn Forge exercise, Able Archer precipitated a crisis situation between NATO and the Soviet Union.

Recommendations

Given the potential risks of military exercises and the increasing tempo of exercises in Europe, combatant commanders should pay increased attention to the risks military exercises pose. Recognizing the risks specific exercises can cause allows a combatant commander to make better

[124] Ibid.
[125] Doward, "How a NATO war game took the world to brink of nuclear disaster."
[126] Hoffman, "In 1983 'war scare,' Soviet leadership feared nuclear surprise attack by U.S."
[127] Ibid.

cost-benefit analyses. In some scenarios, when a combatant commander desires to run exercises to build capabilities, reassure allies, or to deter adversaries, the benefits may outweigh the potential costs. However, if the risks a military exercise could create are too high, a combatant commander can mitigate the risks of military exercises by recognizing how threatening an exercise is and calibrating exercises to avoid these risks. By devoting more attention to the political environment, the threat level of an exercise, and the dangers of military exercises, combatant commanders can better anticipate the risks a military exercise may create.

Consider the Political Environment

A combatant commander planning a military exercise should analyze the political relationship between the countries running the exercise and the adversary, because the political environment influences the ways in which an adversary is likely to respond to a military exercise. Although a combatant commander cannot alter the political environment, it contributes to the risk an exercise presents. Additional and time dependent factors in the political environment can lead to increased tension, which increases misperception.

In many risk cases, changes in the political environment influenced the probability that an adversary would respond in a way that created risk. For example, while Able Archer was a high threat exercise due to the inclusion of nuclear forces, the political environment contributed to the Soviet response and created increased potential for misperception,[128] making it seem possible that the U.S. might be considering nuclear use.

[128] Prior to Able Archer, the USSR was responsible for the downing Korean Airliner 007. The USSR's nuclear warning system had falsely detected Minutemen missiles. This created a hostile political environment. See Vojtech Mastny, "How Able was 'Able Archer'?: Nuclear Trigger and Intelligence in Perspective," *Journal of Cold War Studies* 11 (2009): 117-118, accessed April 30, 2016, https://muse.jhu.edu/article/259186.

Although a combatant commander cannot control the political environment in the run-up to a military exercise, military planners should analyze the political environment to better consider how an adversary may view a military exercise and to more accurately predict the potential risks an exercise may run.

Recognize the Potential for Misperception and Misunderstandings

Military exercises can appear threatening and can create misperception, even when they are not directed against a specific target or when the intention of the exercise is unrelated to the adversary. Because of this, a combatant commander should recognize that even low threat exercises can lead to risks, because an adversary may have unanticipated incentives to respond. Often, countries underestimate the potential for misperception—incorrectly assuming that their signaling will be understood.[129] A combatant commander should attempt to discern how threatening a military exercise may appear to the adversary. Our framework provides one way to examine the threat level by focusing on the magnitude, proximity, and transparency of the exercise.

By determining the threat an exercise may create, the combatant commander can decide whether or not risk mitigation strategies are necessary to reduce the potential dangers of a military exercise. In some cases, the potential costs posed by a risk may be outweighed by the benefits of running the exercise—mission specific training, allied reassurance, or deterrence. In other cases, after recognizing the threat level an exercise, a combatant commander may wish to alter the risks an exercise creates. This can be done by calibrating the threat level of the exercise—the one area that the combatant commander has control over.

[129] Jervis, *Perceptions and Misperceptions*.

Calibrate Exercises to Reduce Risk

If the dangers an exercise creates are deemed too high, a combatant commander can best mitigate these adversary-created risks by calibrating the threat level of the exercise—the proximity, magnitude, and transparency. Changing the location, reducing the number or type of personnel involved, and increasing transparency all provide avenues to mitigate risk. As our dataset, framework, and historical case studies show, military exercises which are close, large, and non-transparent increase the perceived threat level of the exercise, because adversaries may misperceive the intentions or motives behind the exercise and because military exercises can mask troop movements in the lead up to a war.

To lower this threat, a military exercise could be moved further from the border. For example, the biennial Norwegian and NATO exercise Cold Response, has been relocated in the past to reduce the threat level of the exercise. In 2010, 2012, and 2014, Cold Response was held within the Arctic region in northern Norway and came within 100 miles of the Russian border.[130] This close proximity created a high threat level to Russia. Russia responded with a series of snap exercises in 2015 at multiple locations inside the Arctic Circle.[131] In 2016, Cold Response was moved out of the Arctic Circle and into central Norway, which lowered the threat level of the exercise.[132] The exercise, held in February, did not lead to an immediate outcome from Russia. By moving Cold Response 2016 to a less threatening proximity, Norway and NATO were able to decrease the overall threat level of the exercise.

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[130] Trude Petterson, "Cold Response Moves Out of the Arctic," *Barents Observer* (February 16, 2016) http://www.thebarentsobserver.com/security/2016/02/cold-response-moves-out-arctic.; See "Appendix C: Overview of the Bush School Military Exercises Dataset."
[131] Ibid.
[132] Ibid.

A combatant commander could also decrease the number of troops involved or alter the type of forces to reduce risk. In the past the magnitude of Cold Response has been calibrated to reduce the size of the force and to lower the threat level of the exercise. In 2007, Cold Response exercised 10,000 troops, but in the aftermath of the Russo-Georgian War, NATO scaled the exercise down to 7,500 personnel in 2009.[133] By altering the magnitude, the exercise was made to appear less provocative.

And lastly, a combatant commander can also increase transparency to better communicate intentions and motives. Altering transparency has less utility in risk mitigation than changing the proximity of an exercise or the magnitude because many countries, including the U.S. and NATO, currently offer a standard notice of greater than a year prior to running an exercise. Because this level of transparency is expected, providing notice of an exercise does not change the threat level of exercise. Altering transparency only decreases the threat level of an exercise if an adversary is invited on to participate in the exercise or if the exercise was non-transparent—if the exercise is concealed or no notice of the exercise was given—and transparency was introduced.

The highly threatening nature of non-transparent exercises is a function of two issues. One, close and large military exercises are threatening. They can signal a country is planning a military engagement with the adversary, whether in the future by building capabilities, or immediately, through the threat of a surprise attack. Two, non-transparent exercises increase the potential for misperception and signal hostility, because they are designed to mask intentions and motives. For a combatant commander considering or viewing non-transparent exercises, this is of concern. By

[133] "Exercise Cold Response: NATO hold large, multinational exercise in Scandinavia," *Global Research* , March 3, 2009), http://www.globalresearch.ca/exercise-cold-response-nato-holds-large-scale-multinational-exercise-in-scandinavia/12524

adopting these risk mitigation strategies, a combatant commander can decrease the threat level of an exercise, potentially changing the risks an exercise creates.

Conduct Further Research

Although our research has shown that military exercises create risk, further research into the subject is also necessary. Our dataset provides only a narrow sample of large military exercises for which public information is available. Additional research should consider expanding the dataset to look at smaller military exercises. Many exercises are held at the regiment level, which falls below our personnel threshold. This may lead to an underestimation of the risks, because small military exercises can still be threatening if held at close proximity. Additional research could also investigate the dangers arising from cyber, [134] space,[135] and nuclear exercises, as these may present unanticipated risks. Lastly, future research could chart the long-term effects of military exercises on political relations. Although we examine the effects of military exercises on

[134] Although no numbers exist on the number of cyber military exercises run every year, the U.S. and NATO have both executed cyber annexes to military exercises. Since 2012, Estonia has thrice hosted NATO defensive cyber exercises, which involved 35 NATO allied and partner nations. See "Cyber Exercise Challenges Defence," *NATO: Supreme Headquarters Allied Powers Europe*, November 20, 2015, https://www.shape.nato.int/cyber-exercise-challenges-defense; Michael J. Gilmore, "FY 2015 Annual Report," *Director, Operational Test and Evaluation*, January 2016, 389-396, http://www.dote.osd.mil/pub/reports/FY2015/pdf/other/2015cybersecurity.pdf; "The Secretary General's Annual Report, 2015" 23. For general background on the potential for misperception in cyberattacks, see Martin C. Libicki, *Cyberdeterrence and Cyberwar* (Santa Monica: RAND Corporation, 2009), 76-77.

[135] Space military exercises can involve everything from exercises with space-missile defense programs to exercises that simulate shooting down satellites. Certain types of communications exercises may be categorized as space exercises. See U.S. Joint Chiefs of Staff, *Space Operations*, Joint Publication 3-14, (Washington DC: U.S. Joint Chiefs of Staff: May 29, 2013), II-1-II-10. The threat of space exercises is increased because such attacks can threaten international norms. Chinese military exercises have involved shooting down inoperable Chinese satellites. See Jervis, Lebow, and Stein, *Psychology and Deterrence*, 14; Forrest E. Morgan, *Deterrence and First-Strike Stability in Space: A Preliminary Assessment* (Santa Monica: RAND Corporation, 2010), 42-44; Bill Gertz, "Stratcom: China Continuing to Weaponize Space with Latest Anti-Satellite Missile Shot," *The Washington Free Beacon*, August 13, 2014, http://freebeacon.com/national-security/stratcom-china-continuing-to-weaponize-space-with-latest-anti-satellite-missile-shot/.

the U.S.-Russian relationship, further research may reveal ways in which the political relationship interacts with the threat level of an exercise over time in a country-dependent way.

Conclusion

Ultimately, we find that military exercises can create risks, because such exercises can threaten adversaries and because countries running exercises may misperceive the incentives an adversary has to respond. Exercises can be used to build capabilities, reassure allies, deter adversaries, and mask invasion preparations, each of which may appear threatening to a potential adversary. Because of this, exercises can cause accidents, hostility, reciprocity, and crises, depending on the political environment in which they occur and the adversary-perceived threat level the exercise creates. Given the number of exercises the U.S. and NATO run every year, these risks are of concern.

Our analytical framework offers one way to evaluate the risks of a military exercise. By recognizing the risks of military exercises and altering the threat level of an exercise, a combatant commander can mitigate the potential risks an exercise may create. While altering the proximity, magnitude, or transparency of an exercise is not always feasible, these strategies can reduce risk. Additionally, by understanding the political environment and the threat level of an exercise, a combatant commander can make a more informed cost-benefit analysis of a military exercise, deciding if the potential benefits from building capabilities, reassuring allies, or deterring enemies is sufficient to run certain risks.

Appendix A: Variable Explanations

Proximity

We code proximity based on how close an exercise is to an adversary's border or to its spheres of influence. Although this measure does introduce some ambiguity, as it is not calculated using a mileage threshold from the border, it recognizes adversaries have different interests. In particular, a strict miles/kilometers threshold is inappropriate, as smaller countries may have a more acute sense of threat from nearby exercises, while larger countries may expect their influence to expand over a greater area.

Proximity	Threat Level
Within 100 miles of the border[136]	High (3)
Traditional areas of influence	Medium (2)
At distance	Low (1)

When Russia is the potential adversary, we code high threat proximity if an exercise is located in a country sharing a border with Russia or an exercise in the Arctic region. A medium threat proximity exercise is any exercise in the former Soviet Union or within its former sphere of influence. A low threat proximity case includes all other areas. "Figure 3" shows these divisions in Europe.

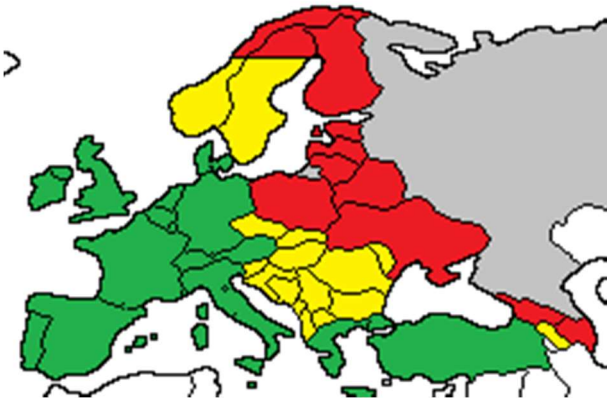


Figure 3: Increasing Magnitude
Data Source: The Bush School

[136] Because exact information on locations is often unavailable, we code an exercise as having high threat proximity if it takes place in a border country.

When China is the potential adversary, we code proximity using a similar mechanism, but also introduce a naval-specific mechanism to account for the frequent naval exercises in the region. A high threat proximity exercise is one held in the first island chain, medium threat proximity exercises are held within the second island chain, South Korea, Japan or Southeast Asia, and low threat includes all exercises located beyond the second island chain. "Figure 4" shows the divisions for naval exercises.

Figure 4: Increasing Magnitude
Data Source: "People's Liberation Navy - Offshore Defense," *Global Security*, accessed April 17, 2016, http://www.globalsecurity.org/military/world/china/plan-doctrine-offshore.htm.

Magnitude

Magnitude is a composite variable, based on force size, percentage increase between exercise years, and force mix. The three variables are individually calculated and then we calculate the overall magnitude score based on an average of the three scores.

Percentage Increase

Evidence from our research demonstrates that if an exercise experiences a significant increase in magnitude from one year to the next, the adversary is likely to perceive the exercise as more threatening. As such, we code the percentage increase from the previous iteration of an exercise. For example, many countries repeat exercises on an annual or biannual basis. In 2011, Russia's Center military exercise used 12,000 personnel, while Center 2015 increased in size to

95,000 personnel.[137] This would indicate a high threat exercise. New exercises are coded as high threat, because they may signal a change in intentions or motives. The coding rules for the percentage force increase is shown below in the table:

Percentage Increase	Threat Level
> 25% increase	High (3)
0-25% increase	Medium (2)
< 0% increase	Low (1)

Force Size

The threat level of force size is based on the standard U.S. Army unit size. A military exercise which exercises a force less than a two regiments in size (3,000 personnel) is coded as low threat. An exercise involving a force greater than two regiments, but less than a division (3,000-10,000 personnel) is coded as a medium threat. Force sizes equivalent to a division (10,000 personnel) or larger are coded as highly threatening to the adversary.

Overall Participation	Threat Level
> 10,000	High (3)
3,000-10,000	Medium (2)
< 1,500	Low (1)

[137] See Matthew Bodner, "Russia Launches Largest Military Maneuvers of 2015," *The Moscow Times*, September 14, 2015, http://www.themoscowtimes.com/business/article/russia-launches-largest-military-maneuvers-of-2015/530316.html; Richard Weitz. "Kazakhstan and Russia Complete Aldaspan-2012 Military Exercises," *Eurasia Daily Monitor* 9, no. 139, July 23, 2012, http://www.jamestown.org/programs/edm/single/?tx_ttnews%5Btt_news%5D=39662&cHash=3b6c48e03e04ddfbe79453f038eea106#.VxYVcPkrLIV

Force Mix

We also code exercises based on the force mix of the participating military unit because certain types of military units are more threatening than others.[138] Exercises may serve as a cover for war preparations, so exercising units capable of taking territory or launching debilitating strikes presents the highest threat. The high threat exercises include all-arms exercises, as well as combined arms exercises that involve ground forces with supporting airframes. Medium threat exercises involve airframes, or mixed naval and air units. Naval and command post exercises are coded as the least threatening. Lastly, while the effects of space and cyber exercises require more research, nuclear exercises create a high potential threat.

Force Mix	**Threat Level**
All arms integration, ground forces, nuclear integration	High (3)
Air or air and naval forces	Medium (2)
Naval forces, command post exercises	Low (1)
Space and cyber also contribute to the force mix threat.	

Transparency

We code transparency based on a scale ranging from no notice exercises to exercises with adversary participation. Because long notice of over six months is standard for military exercises, this level of notice is considered the baseline. Less transparent exercises can add to the threat level of the exercise, while including the adversary as an observer or participant mitigates some of the

[138] Barry Blechman & Stephen S Kapaln, *Force Without War* (Washington DC: Brookings Institution Press, 1979)

risk of the exercise. The table below shows the transparency spectrum of threat, as well as the specific weight we assign each level of transparency:

	Most Threatening					Least Threatening
Notice	Concealed	Snap, Short Notice	Long Notice	Long Notice	Long Notice	Long Notice
Adversarial Participation	None	None	None	Observers	Limited Force Participation	Full Force Participation
Threat Level	High (+.5)	High (+.5)	Medium (0)	Medium (0)	Low (-.5)	Low (-.5)

Composite Threat Level Ranking

After assigning individual scores for proximity, magnitude, and transparency, we created a composite score for threat. Because proximity and magnitude are the two most important determinates of threat, we first average the threat ranking for the two variables, using the numerical score assigned to each variable. Because transparency increases the threat or can mitigate these risks, we then add or subtract the point values of transparency from the overall score.

$$(Proximity + Magnitude)/2 \pm Transpare = Combined\ Threat\ Level\ Ranking$$

Political Environment

We code the political environment as "non-hostile" or "hostile," based on the number of provocative acts and diplomatic overtures in the previous year between the country running the exercise and the adversary. We focus on both military actions and political efforts. Among our measures, we count provocative military actions, including changes in force basing, shows of force, military invasions, skirmishes, and conflict, as well as positive overtures like mil-to-mil cooperation. We also examine both hostile and positive political acts, such as levying or removing

sanctions, ousting or strengthening the relationship between political figures and international organizations, and suspending or joining treaties. This allows us to determine when a political relationship is hostile and when it is non-hostile.

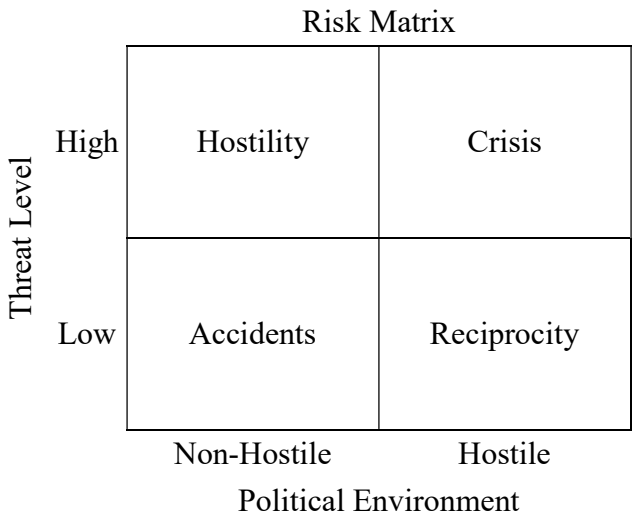
This is a rough measurement, as the political relationship between countries may change quickly, be difficult to determine, or be characterized by hostility on only one side. Below we include our characterization of the U.S.–Russian relationship. Although multiple events factored into our characterizations, we list only the most significant.

U.S. – Soviet and Russian Relationship, 1969 – 2016[139]	
Non-Hostile	**Hostile**
	1969 – 1974 • Military build-up continues, despite détente
1974 – 1978 • Détente • SALT II	1979 – 1989 • Soviets invade Afghanistan • Reagan elected • Downing of KAL 007
1989 – 1998 • Dissolution of USSR	February 1998 – June 1999 • Kosovo
July 1999 – March 2003 • Moscow Treaty	April 2003 – 2009 • NATO expansion Russo-Georgian War
2010 – Aug 2012 • "Russian reset" • New START	September 2012 – present • Russia ousts USAID • Magnitsky Act • Crimea • Ukraine

[139] See "Russia Profile Timeline." *BBC News.* http://www.bbc.com/news/world-europe-17840446; see also U.S. Department of State. *Highlights in the History of U.S. Relations with Russia, 1780-June 2006*. May 11, 2007. http://www.state.gov/p/eur/ci/rs/200years/c30272.htm.

Predicted Risk

We predict risks based on the political environment and threat level of the exercise, using the Risk Matrix. Exercises are first divided by the political environment. Accidents and hostility are the highest risks an exercise in a non-hostile environment is likely to create. Exercises in a hostile environment may lead to crisis or reciprocity. Any exercise with an overall medium-high (2.5) threat score or higher falls in the upper category—risking hostility or crisis, depending on the political environment. Any exercise with a rank below this falls into the lower half of the Risk Matrix—risking accidents or reciprocity.



Outcome Determination

To code the outcomes of a case, we examine the months between the exercise's announcement, the duration of the exercise, and the month immediately following the exercise. We code only for the highest risk an exercise creates. For example, while many reciprocal exercises cause hostility, we code only for reciprocity, as it is the highest risk.

A case is coded as having an "accident" *only* if there is an unintentional incident involving military to military contact between the country running the exercise and the adversary. Although many exercises result have resulted in accidental deaths or loss of equipment, we are only concerned with accidents involving the adversary.

We code for "hostility" based on negative political statements about an exercise. Although we can often measure a down-turn in the political relationship following an exercise, this metric is less clear—as military exercises can both contribute to and be leading indicators of a worsening political relationship.

We code "reciprocity" if the adversary holds a military exercise immediately prior, during, or after another military exercise. To control for the ubiquity of military exercises, we focus on exercises which are new, close, or unannounced.

We code a "crisis" if the adversary takes non-exercise related military action following a military exercise. This includes (but is not limited to) putting forces on alert, temporarily deploying forces, and fighting between the country and adversary.

Determining the Mission and Adversary

Although our framework allows for the evaluation of risk from any potential adversary's perspective, we focus on the U.S. and potential U.S. adversaries when calculating the risks military exercises create. We evaluate cases based on the closest adversary. In Europe and the Arctic, we examine cases from the perspective of Russia and the U.S. In Asia, we analyze threat from the perspective of China and the U.S. However, any country dyad could be examined in the place of these adversaries.

Appendix B: Additional Case Studies

Accidents: RIMPAC 2014

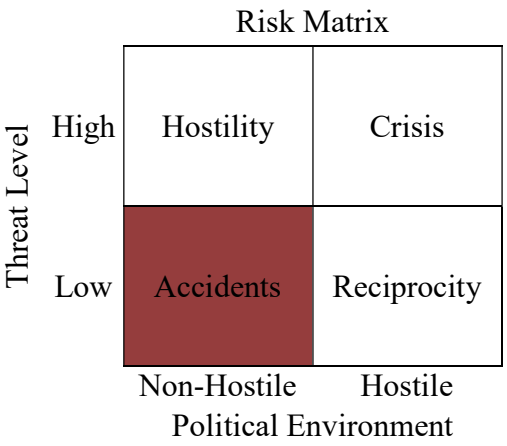
RIMPAC 2014	Ranking[140]
Political Environment	Non-hostile
Proximity	Low
Magnitude	High
Transparency	High
Composite Threat Score	Low
Predicted Risk	Accidents
Outcome	None

In 2014, the U.S. held RIMPAC 2014, a low threat exercise which risked an accident. During the exercise, in which the PRC participated, the Chinese navy sent a Dongdiao class auxiliary general intelligence (AGI) ship to gather communication and electronic data from other ships and aircraft without notice.[141] Although an incident did not occur, the exercise could have led to an accident, because China's covert surveillance was unanticipated.

RIMPAC was a low threat exercise, held while relations were non-hostile. In 2014, the political relationship between the U.S. and China was non-hostile. In June 2013, Presidents Barack Obama and Xi Jinping met in California to forge a "new model" of relations between their countries. [142] Their discussions covered topics such cybersecurity, North Korea's nuclear program, the economy, and climate change.[143] The two countries also held a Strategic and Economic Dialogue in Beijing in June 2014.[144] Although there were areas of contention, the relationship was non-hostile.

[140] See the "Bush School Military Exercises Dataset" for specific coding.
[141] Zachary Keck, "China is Spying on RIMPAC," *The Diplomat*, July 20, 2014, accessed May 2, 2016, http://thediplomat.com/2014/07/china-is-spying-on-rimpac/.
[142] Greg Botelho, Dan Merica and Jessica Yellin, "Despite Tensions, U.S. Chinese Leaders Talk of Forging 'New Model' in Relations," *CNN Politics*, June 9, 2013, http://www.cnn.com/2013/06/07/politics/us-china-summit-cyber-spying/index.html.
[143] Ibid.
[144] U.S. Department of State, *U.S.-China Strategic and Economic Dialogue to be Held in Beijing, China, on July 9-10, 2014*, June 30, 2014, http://www.state.gov/r/pa/prs/ps/2014/06/228571.htm

During this time, the U.S. held RIMPAC 2014—the largest multinational maritime exercise in the world.[145] In total, twenty-two nations participated, [146] including China.[147] The number of forces exercised was large, with 25,000 troops, 49 ships, six submarines, and more than 200 aircraft.[148] However, the area of the exercise was non-threatening, as it was held in the United States' exclusive economic zone (EEZ) around the Hawaiian Islands and southern California.[149] Because of the Chinese participation, transparency was high. This was the first time China had been invited to participate in RIMPAC. [150] Although the magnitude was large, the non-threatening proximity and high transparency offset the threat level of the exercise. With a non-hostile relationship and as a low-medium threat exercise, the exercise risked an accident.



Despite participating in the exercise, the PRC sent an AIG spy ship to RIMPAC 2014.[151] While no serious accidents occurred during the exercise, the potential for misperception or an accident due to China's intelligence gathering put other participating countries on edge.[152] China's response to the exercise created the risk of a ship-to-ship accident, personnel misunderstanding, or equipment failure, all of which could have resulted in negative consequences. This highlights how

[145] Commander, U.S. Pacific Fleet, *RIMPAC 2014*, 2014, http://www.cpf.navy.mil/rimpac/2014/.
[146] Ibid.
[147] U.S. Navy, "RIMPAC 2014: The Evolution of Cohesiveness," *NAVY Live*, July 31, 2014, http://navylive.dodlive.mil/2014/07/31/rimpac-2014-the-evolution-of-cohesiveness/.
[148] Michael Fabey, "Why Did China Participate in RIMPAC with One Ship And Spy on it with Another?" *Aviation Week Network,* accessed August 15, 2014, http://aviationweek.com/military-government/why-did-china-participate-rimpac-one-ship-and-spy-it-another.
[149] Paul Szoldra, "China Deploys Spy Ship Off the Coast of Hawaii," *Business Insider*, July 18, 2014, http://www.businessinsider.com/china-spy-ship-hawaii-2014-7.
[150] U.S. Navy, "RIMPAC 2014: The Evolution of Cohesiveness."
[151] Keck, "China is Spying."
[152] Szoldra, "China Deploys Spy Ship Off the Coast of Hawaii."

even low threat exercises can risk accidents as an adversary may react in unanticipated or dangerous ways.

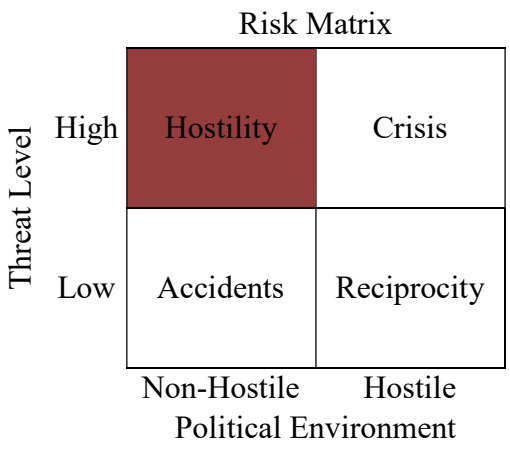
Hostility: Cold Response 2012

In March 2012, NATO conducted an annual military exercise, Cold Response, in Northern Norway. Although the political environment was non-hostile, Russia condemned the exercise, creating a negative political outcome.

Cold Response 2012	**Ranking**[153]
Political Environment	Non-hostile
Proximity	High
Magnitude	High
Transparency	Medium
Composite Threat Score	High
Predicted Risk	Hostility
Outcome	Hostility

As previously discussed, in 2012 the U.S., NATO, and Russia had a relatively non-hostile relationship. In addition to the "Russian reset," NATO and Russia were cooperating on counter-terrorism, anti-hijacking ventures, and nuclear issues.[154] Russia was also allowing NATO to supply troops in Afghanistan through the NDN.[155] In this environment, Cold Response 2012 contributed to the deteriorating relationship which followed throughout the end of 2012 and 2013.

Cold Response was a high threat NATO exercise. Although it was a repeated exercise, the 2012 iteration was especially threatening to Russia. Although NATO's stated mission for Cold Response 2012 was to "rehearse high intensity Crisis Response Operations in winter conditions,"[156] the magnitude and location were



[153] See the "Bush School Military Exercises Dataset" for specific coding.
[154] Nichol, *Russian Political*.
[155] Kuchins and Sanderson, "Northern Distribution Network."
[156] "NATO Exercise 'Cold Response 2012': A Crisis Response Operation or a Provocation to Russia? *NATO* Watch, March 5, 2012. http://natowatch.org/node/635

threatening. The magnitude of the exercise was high. The exercise included 16,000 personnel, with representation from all three services of the fifteen participating NATO countries. This was the "largest military exercise in Norway in ten years."[157] Additionally, the exercise location was threatening. It was held in the northern Norway, extremely close to the Barents Sea, an area with major Arctic trading routes used by Russia.[158] Because of the non-hostile political environment and the high threat level of Cold Response 2012, the exercise risked a hostile political response.

The Russians viewed Cold Response 2012 as extremely provocative. They claimed the exercise was a "sign of NATO wanting to strengthen its geopolitical and diplomatic efforts with military might."[159] President Putin issued strongly negative statements in response to Cold Response 2012.[160] Although Cold Response 2012 was only a contributing factor, over the next three years, the relationship between the two countries deteriorated further. Because of the location and magnitude, Cold Response 2012 was highly threatening to Russia and resulted in negative political repercussions.

To mitigate the risks of a potential hostile response, NATO could have scaled down the size of the exercise. Between 2006 and 2010, Cold Response exercises had force sizes ranging from 7,500 to 10,000.[161] The sharp increase in 2012, which nearly doubled the magnitude, contributed to the threatening nature of the exercise.[162] Although proximity was also high, mitigating this risk would have been difficult, because the mission was designed to test actions in winter conditions.

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[157] Ibid.
[158] Ibid.
[159] "Russia Finds NATO Exercise in Norway Provocative," The Nordic Page, March 14, 2012, http://www.tnp.no/norway/panorama/2791-russia-finds-nato-exercise-in-norway-provocative.
[160] Ibid.
[161] Rick Rozoff, "TOP OF THE WORLD: NATO Rehearses For War In The Arctic." *Global Research*, April 24, 2012. http://www.globalresearch.ca/top-of-the-world-nato-rehearses-for-war-in-the-arctic/30508.
[162] Ibid.

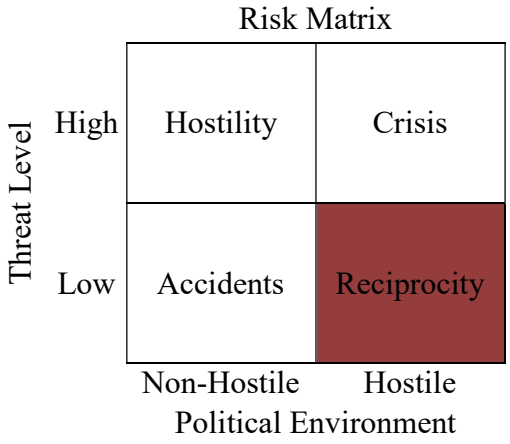
Cold Response 2012 shows how a high threat military exercise, even in a non-hostile relationship, can spark hostile rhetoric and actions. Because Cold Response 2012 was large and held in close proximity to Russian interests, Russia responded with hostility.

Reciprocity: Trident Juncture 2015 and Center 2015

Trident Juncture 2015	**Ranking**[163]
Political Environment	Hostile
Proximity	Low
Magnitude	High
Transparency	Medium
Composite Threat Score	Medium
Predicted Risk	Reciprocity
Outcome	Reciprocity

Between 2014 and 2015, NATO and Russia entered into a spiral of reciprocal military exercises. During this period, NATO ran Trident Juncture 2015, the largest NATO exercise since the Cold War.[164] Russia ran Center 2015, an exercise twice as large, involving nearly 100,000 personnel.[165] These exercises highlight the escalatory dangers of reciprocity.

When NATO held Trident Juncture 2015, it was the largest NATO exercise since the Cold War.[166] In total, 36,000 personnel participated, including 140 aircraft and more than 60 ships.[167] Trident Juncture 2015's mission was to address "hybrid warfare threats and other new tactics of war,"[168] Secretary General Jens



[163] See the "Bush School Military Exercises Dataset" for specific coding.
[164] Brian Reynolds. "Operation Trident Juncture shows America flexing its military muscle." *Chron*. November 11, 2015. http://www.chron.com/news/nation-world/article/Operation-Trident-Juncture-shows-America-6625099.php.
[165] Lukasz Kulesa, "Towards a New Equilibrium: Minimizing the risks of NATO and Russia's new military postures," *European Leadership Network*, February 2016, 44, http://www.europeanleadershipnetwork.org/medialibrary/2016/02/07/180d69f6/Towards%20a%20New%20Equilibrium%202016.pdf.
[166] Reynolds, "Operation Trident Juncture."
[167] Ibid.
[168] Ibid.

Stoltenberg's also stated that "NATO is able to defend all Allies against any threat."[169] Both the mission of the exercise and statements by high level officials may have indicated hostility towards Russia, particularly as Russia had used hybrid warfare in the past.[170] In spite of this rhetoric, NATO did take steps to moderate the risk to Russia—giving two years notice and holding the exercise outside of Russia's border region and areas of influence. NATO also invited observers from all member nations of the OSCE.[171] Proximity was low, as the exercise was primarily held in Spain, Italy, and Portugal.[172] Because of the high number of personnel, the potential targeting of Russia, and the risk mitigation strategies, the exercise posed a medium-high threat to Russia, which created the potential for crisis and reciprocity.

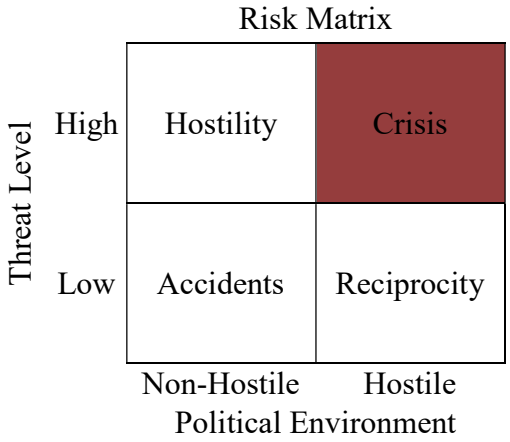
Less than two months before Trident Juncture 2015, Russia held Center 2015, an extremely large military exercise in the central and south regions of Russia.[174] Although Center 2015 was held two months prior to the NATO exercise, because Trident Juncture 2015 was announced two years in advance, the Russian exercise was likely reciprocal.

Center 2015	**Ranking[173]**
Political Environment	Hostile
Proximity	High
Magnitude	High
Transparency	Low
Composite Threat Score	High
Predicted Risk	Crisis
Outcome	Reciprocity

Although Center 2015 was a repeated exercise, the scale and complexity of the exercise dramatically increased in 2015. Center 2015 involved over 95,000 Russian personnel, 170 aircraft, 20 ships and over 7,000 pieces of combat equipment.[175] This was vastly larger than previous Center

[169] "Trident Juncture shows NATO capabilities 'are real and ready'," *NATO*, November 4, 2015, http://www.nato.int/cps/en/natohq/news_124265.htm.
[170] Whitmore, "Did Russia Plan Its War In Georgia?"
[171] Ibid.
[172] "Trident Juncture Shows NATO Capabilities are Real and Ready."
[173] See the "Bush School Military Exercises Dataset" for specific coding.
[174] "Russia to Hold More Large Scale Military Maneuvers in 2015," *Russia Today*, December 1, 2014, https://www.rt.com/news/210451-russia-maneuvers-center-2015/.
[175] Bodner, "Russia Launches Largest Military Maneuvers of 2015."

exercises conducted in 2008 and 2011. Center 2008 utilized only 2,000 Russian and Kazakh troops and Center 2011 exercised 12,000 combined troops.[176] The stated objective of Center 2015 was to react to conflict in Central Asia, however, the timing of the exercise and the mission testing "territorial defense and mobilization deployment,"[177] both appeared to threaten NATO.



For both exercises, steps could have been taken to reduce the risk of a response by altering the magnitude of the exercises. While NATO did take steps to mitigate the risk by choosing a distant location and inviting on observers, the provocative rhetoric surrounding the exercise contributed to the risk. Additionally, Russia's dramatic force increase from previous iterations and relative lack of transparency contributed to the threat level of Center 2015. Steps could have been taken during the planning stages of both military exercises to mitigate risks, by moderating rhetoric and altering the magnitude of the exercises.

Trident Juncture 2015 and Center 2015 show the dangers of tit-for-tat reciprocal exercises, which have continued to increase in magnitude and frequency since Russia's seizure of Crimea and the Ukraine crisis. The hostile political relationship between NATO and Russia contributes to mutual distrust and creates incentives to run larger military exercises for training, reassurance, and deterrence purposes. This creates compounded dangers, as Russia's reciprocal exercises vastly outnumber the size of the NATO exercises.[178] Furthermore, because Russia has used military

[176] Weitz. "Kazakhstan and Russia Complete Aldaspan-2012 Military Exercises."
[177] "Russia to hold more."
[178] United States Senate Committee on Armed Services, "NATO Russia Exercise Gap," April 28, 2015, http://www.armed-services.senate.gov/imo/media/doc/NATO-Russia%20Exercise%20Gap%20Chart%20Mk.III_Brzezinski_04-28-15.pdf.

exercises to mask invasion forces in the past, large military exercises with little notice appear threatening and may act as cover for future invasion forces.

Crises: Exercise Brasstacks 1986

Exercise Brasstacks 1986	**Ranking**
Political Environment	Hostile
Proximity	High
Magnitude	High
Transparency	Low
Composite Threat Score	High
Predicted Risk	Crisis
Outcome	Crisis

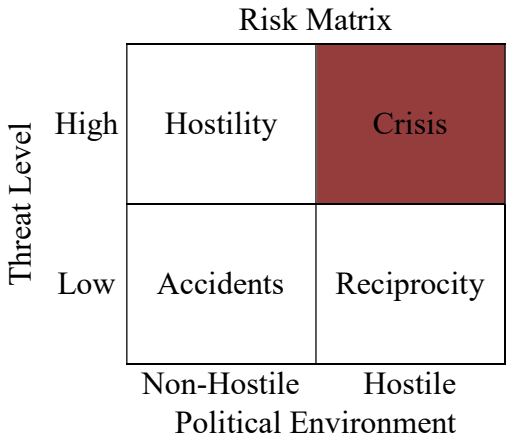
In 1986, India ran Exercise Brasstacks, a highly threatening and massive military exercise along Pakistan's border. [179] At the time, the political relationship with Pakistan was extremely hostile. In response to the exercise, Pakistan mobilized troops and took battle positions, forcing the Indians military to cease maneuvers.[180]

In the lead up to 1986 exercise, India and Pakistan had a hostile political relationship. In 1984, Pakistani government white papers were leaked detailing how Pakistani forces could undermine Indian rule in the Punjab region.[181] Shortly thereafter, the Indian government claimed to have evidence that Pakistan was materially supporting separatists in the same region.[182] In 1986, India faced a wave of anti-Muslim riots.[183] Because of these factors, when Exercise Brasstacks was run, the political relationship between Pakistan and India was hostile.

In 1986, India held Exercise Brasstacks, a highly threatening exercise with large magnitude exercise, close proximity, and little transparency. It was designed to test new equipment and

[179] Steven R. Weiseman, "On India's Border, a Huge Mock War," March 6, 1987, http://www.nytimes.com/1987/03/06/world/on-india-s-border-a-huge-mock-war.html.
[180] Ibid.
[181] James Heitzman and Robert L. Worden, eds, *India: A Country Study* (Washington: GPO for the Library of Congress, 1995).
[182] "Operation Brasstacks 1986-87," *HistoryPak*, accessed May 1, 2016, http://historypak.com/brasstack-crisis-1986-87/.
[183] Heitzman and Worden, *India: A Country Study.*

maneuver warfare concepts.[184] The actions India took when planning this exercise sent a threatening signal to Pakistan. The exercise had over 500,000 troops (when including the naval annex).[185] There was all-arms integration, including a significant naval annex, with Indian Navy vessels exercising in the waters off of Gwadar, Pakistan's only major port.[186] Additionally, Indian forces were exercised in extremely sensitive locations near the Pakistani border. The exercise was held in Rajasthan, less than 100 miles from the Pakistani border.[187] From the exercise location, India could have launched an assault to bisect Pakistan.[188] Additionally, transparency was very low. The exercise had never been held before and India sent no official communication to Pakistan explaining the exercise.[189] This all contributed to a high threat exercise.



Because of the extremely threatening nature of the exercise, during a hostile political relationship, Exercise Brasstacks risked and precipitated a crisis. The exercise appeared to signal Indian intentions to invade Pakistan in the immediate future. Pakistan responded by mobilizing its forces and taking battle positions. During the same period, India responded by counter-mobilizing along the border. Indian and Pakistani leaders worked to resolve the crisis in what has become to be known as the period of "cricket diplomacy," eventually agreeing to a ceasefire and removal of troops from the border regions.[190]

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[184] "Brasstacks," *Global Security*, accessed May 1, 2016, http://www.globalsecurity.org/military/world/war/brass-tacks.htm.
[185] Ibid.
[186] Prem Nath Hoon, "War Games or War?" Excerpt from Lt Gen Hoon's book, accessed May 1, 2016, http://www.hoonslegacy.com/brass-tacks/
[187] "Brasstacks," *Global Security.*
[188] Ibid.
[189] Ibid.
[190] "Pakistan and the World During the Zia Regime," *Pakistan Defence Journal*, Retrieved 1 May 2016.

India could have taken several steps to mitigate the risk of a crisis. The troops could have been exercised in other locations, further from the border. The size of the exercise could have been lowered, with different divisions operating at alternating times. And lastly, transparency could have been increased. Although participation would be unlikely, India could have offered Pakistan a limited observer status or provided more details on the exercise to increase transparency.

Ultimately, because of the political environment and high threat level of the exercise, Exercise Brasstacks precipitated a crisis situation between India and Pakistan.

Appendix C: Overview of the Bush School Military Exercise Dataset

More detailed information on these military exercises may be found in the Bush School Military Exercises Dataset.

Year	Exercise	Country A (Running)
2016	Cobra Gold	US, Thailand
2016	Cold Response Feb 16	NATO
2016	Cope Tiger	US, Thailand, Singapore
2016	Key Resolve	US, ROK
2016	RIMPAC	US
2016	Snap Ukraine Apr 16	Russia
2015	Airborne Forces Feb 15	Russia
2015	Allied Shield June 15	NATO
2015	Arctic Challenge 15	Norway, Sweden, Finland
2015	Balikatan	US, Philippines
2015	Baltic Snap Mar 15	Russia
2015	BALTOPS Jun 15	NATO
2015	Barents Rescue 15	Finland, Russia, Norway, Sweden
2015	Capable Logistician	NATO and Partners
2015	Center 15	Russia
2015	Cobra Gold	US, Thailand
2015	Combat Commonwealth 15	Russia
2015	Cooperation Aug 15	Russia
2015	Dragon Oct 15	Poland
2015	Dynamic Mongoose	NATO
2015	Han Kuang 31	Taiwan
2015	Hedgehog 2015	Estonia
2015	Immediate Response 15	US, PfP
2015	Interaction 15	Russia
2015	Iron Sword Nov 15	NATO
2015	Joint Viking Mar 15	Norway
2015	Joint Warrior 15	UK
2015	Keen Sword	Japan, US
2015	Key Resolve	US, ROK

Year	Exercise	Country A (Running)
2015	Noble Jump Jun 15	NATO
2015	Rapid Trident 15	NATO
2015	Saber Junction Apr 15	Germany
2015	Saber Strike Jun 15	NATO
2015	Sea Breeze 15	Ukraine
2015	Sea Shield 15	Romania
2015	Snap AF & Def May 15	Russia
2015	Snap Arctic March 15	Russia
2015	Spring Storm May 15	Estonia
2015	Steadfast Javelin	NATO
2015	Strategic Nuclear Oct 15	Russia
2015	Strategic Nuclear Sept 15	Russia
2015	Swift Response Aug-Sept 15	US
2015	Talisman Saber	Australia, USA
2015	Trident Joust Jun 15	NATO
2015	Trident Juncture 15	NATO
2015	Trident Poseidon 15	NATO
2015	Union Shield Sept 15	Russia
2015	Vostok 10	Russia
2015	Wind Spring Apr 15	Romania
2014	Anakonda Sep-Oct 14	Poland
2014	Balikatan	US, Philippines
2014	Black Eagle Nov 14	Poland
2014	Bold Alligator 14	US
2014	Central Snap Jun 14	Russia
2014	Cobra Gold	US, Thailand
2014	Cold Response 14	Norway
2014	Danube Express Oct 14	Romania
2014	Han Kuang 30	Taiwan

Year	Exercise	Country A (Running)
2014	Iron Sword Nov 14	NATO
2014	Joint Warrior 14	UK
2014	Keen Sword	Japan, US
2014	Noble Justification 14	NATO
2014	Noble Ledger Sep-Oct 14	NATO
2014	Peace Mission 14	Russia
2014	RIMPAC	US
2014	Saber Junction Aug 14	NATO
2014	Saber Strike Jun 14	Baltics
2014	Snap East 14	Russia
2014	Snap East Jul 14	Russia
2014	Snap East Sep 14	Russia
2014	Snap March 14	Russia
2014	Spring Storm 14	Estonia
2014	Steadfast Javelin 1	Estonia
2014	Steadfast Javelin 2 Sept 14	Baltics
2014	Strategic Nuclear May 14	Russia
2014	Ukraine Snap Apr-May 14	Russia
2014	Valiant Shield	US
2014	Vostok 14	Russia
2014	Vostok 14 Rocket Sept	Russia
2014	Western Snap Dec 14	Russia
2014	Western Snap Feb-Mar 14	Russia
2013	Aerospace Def Snap May	Russia
2013	AF Snap Jun 13	Russia
2013	Arctic Challenge 13	NATO
2013	Balikatan	US, Philippines
2013	Boevoe Sodruzhestvo	Russia
2013	Capable Logistician	NATO and Partners
2013	Cobra Gold	US, Thailand
2013	Han Kuang 29	Taiwan
2013	Joint Warrior 13	UK
2013	Northern Fleet 13	Russia
2013	Pomor 13	Russia

Year	Exercise	Country A (Running)
2013	Sea Breeze 13	NATO (PfP)
2013	Snap Central Feb 13	Russia
2013	Snap East Jul 13	Russia
2013	Snap South Mar 13	Russia
2013	Spring Storm 13	Estonia
2013	Steadfast Jazz 13	NATO
2013	Strategic Rocket Jul 13	Russia
2013	Talisman Saber	Australia, USA
2013	Zapad 2013	Russia
2012	Aldaspan 12	Russia
2012	Balikatan	US, Philippines
2012	Bold Alligator 12	US
2012	Cobra Gold	US, Thailand
2012	Cold Response 12	Norway
2012	Han Kuang 28	Taiwan
2012	Kavkaz 12	Russia
2012	Pomor 12	Russia
2012	RIMPAC	US
2012	Rubezh 2012	Russia
2012	Sea Breeze 12	NATO (PfP)
2011	Balikatan	US, Philippines
2011	Bold Alligator 11	US
2011	Center 11	Russia
2011	Cobra Gold	US, Thailand
2011	Combat Commonwealth 11	Russia
2011	Han Kuang 27	Taiwan
2011	Immediate Response 11	US
2011	Pomor 11	Russia
2011	Schit Soiuza 2011	Russia
2011	Sea Breeze 11	NATO (PfP)
2011	Shygys 11	Russia
2011	Talisman Saber	Australia, USA
2010	Cold Response 10	Norway
2010	Peace Mission 10	Russia

Year	Exercise	Country A (Running)
2010	RIMPAC	US
2010	Sea Breeze 10	NATO (PfP)
2009	Cold Response 09	Norway
2009	Cooperative Longbow/Lancer	NATO, PfP
2009	Immediate Response 09	US
2009	Kavkaz 09	Russia
2009	Talisman Saber	Australia, USA
2009	Zapad 2009	Russia
2008	Center 08	Russia
2008	Immediate Response 08	US
2008	Kavkaz 08	Russia
2008	RIMPAC	US
2008	Sea Breeze 08	NATO (PfP)
2008	Stability	Russia
2007	Balikatan	US, Philippines
2007	Cold Response 07	Norway
2007	Cooperative Longbow/Lancer	NATO, PfP
2007	Immediate Response 07	US
2007	Northern Edge/Alaska Shield	US
2007	Peace Mission 07	Russia
2007	Sea Breeze 07	NATO (PfP)
2007	Talisman Saber	Australia, USA
2007	Valiant Shield	US
2006	Balikatan	US, Philippines
2006	Cold Response 06	Norway
2006	Cooperative Longbow/Lancer	NATO, PfP
2006	RIMPAC	US
2006	Rubezh 2006	Russia
2006	Russia-Belarus	Russia
2006	Valiant Shield	US
2005	Balikatan	US, Philippines
2005	Han Kuang 21	Taiwan
2005	JASEX	US
2005	Peace Mission 05	Russia

Year	Exercise	Country A (Running)
2005	Rubezh 2005	Russia
2005	Talisman Saber	Australia, USA
2004	Balikatan	US, Philippines
2004	Han Kuang 20	Taiwan
2004	RIMPAC	US
2004	Rubezh 2004	Russia
2003	Balikatan	US, Philippines
2003	Tandem Thrust	US
2002	Balikatan	US, Philippines
2002	RIMPAC	US
2002	Sea Breeze 02	NATO (PfP)
2001	Balikatan	US, Philippines
2001	Sea Breeze 01	NATO (PfP)
2001	Tandem Thrust	US, Australia
2000	Cooperative Best Effort 00	NATO
2000	RIMPAC	US
2000	Summer-X	Russia
1999	Sea Breeze 99	NATO (PfP)
1999	Tandem Thrust	US, Australia
1999	Zapad (West) - 99	Russia
1998	RIMPAC	US
1998	Sea Breeze 98	NATO (PfP)
1997	Tandem Thrust	US, Australia
1995	Tandem Thrust	US
1994	Atlantic Resolve	NATO
1993	Reforger 93 CPX Chariot Fury	NATO
1992	Reforger 92 CPX Certain Caravan	NATO
1991	Reforger 91 CPX Certain Shield	NATO
1990	Reforger 90 Centurion Shield	NATO
1988	Reforger 88 Certain Challenge	NATO
1987	Reforger 87 Certain Strike	NATO
1986	Reforger 86 Certain Sentinel	NATO
1986	Exercise Brasstacks	India
1985	Reforger 85 Central Guardian	NATO

Year	Exercise	Country A (Running)
1984	Reforger 84 Certain Fury	NATO
1983	Reforger 83 Confident Enterprise	NATO
1983	Able Archer/Autumn Forge	NATO
1982	Reforger 82 Carbine Fortress	NATO
1981	Reforger 81 Certain Encounter	NATO
1981	Zapad 81	USSR
1980	Reforger 80 Certain Rampart	NATO
1979	Reforger 79 Certain Sentinel	NATO
1978	Reforger 78 Certain Shield	NATO
1977	Reforger 77 Carbon Edge	NATO
1976	Reforger 76 Lares Team	NATO
1976	Reforger 76 Gordian Shield	NATO
1975	Reforger 75 Certain Trek	NATO
1974	Reforger 74 Certain Pledge	NATO
1973	Reforger IV Certain Shield	NATO
1973	Reforger V Certain Charge	NATO
1971	Reforger III Certain Forge	NATO
1970	Reforger II Certain Thurst	NATO
1969	Reforger I Carbide Ice	NATO
1994	Atlantic Resolve	NATO
1993	Reforger 93 CPX Chariot Fury	NATO
1992	Reforger 92 CPX Certain Caravan	NATO
1991	Reforger 91 CPX Certain Shield	NATO
1990	Reforger 90 Centurion Shield	NATO
1988	Reforger 88 Certain Challenge	NATO
1987	Reforger 87 Certain Strike	NATO
1986	Reforger 86 Certain Sentinel	NATO
1986	Exercise Brasstacks	India
1985	Reforger 85 Central Guardian	NATO
1984	Reforger 84 Certain Fury	NATO
1983	Reforger 83 Confident Enterprise	NATO
1983	Able Archer/Autumn Forge	NATO
1982	Reforger 82 Carbine Fortress	NATO
1981	Reforger 81 Certain Encounter	NATO

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Exercises and Adversaries

Capstone Project for RAND Corporation Intelligence Policy Center (IPC)
Supervisor: Dr. Jasen J. Castillo

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CENTRAL QUESTIONS

- When and why are military exercises dangerous?
- How can a combatant commander mitigate the risks?

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SUMMARY

- Military exercises are held for many reasons, which creates risks
  - Exercises run different risks
  - Mitigating risks requires understanding and addressing the pathways to unintended consequences

AGENDA

- Overview of Problem
- Analytical Framework
- Historical Case Studies
- Recommendations
- Conclusion

What are the risks?

THE RISKS

Accidents

Hainan Island Incident, 2001

THE RISKS

Hostility

Zapad-99, 1999

THE RISKS

Reciprocity

Trident Juncture, 2015

THE RISKS

Crisis

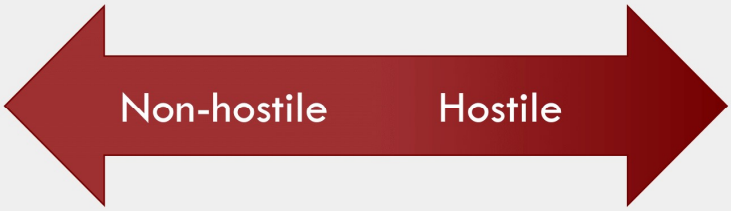
Able Archer, 1983

AGENDA

- Overview of Problem
- Analytical Framework
- Historical Case Studies
- Recommendations
- Conclusion

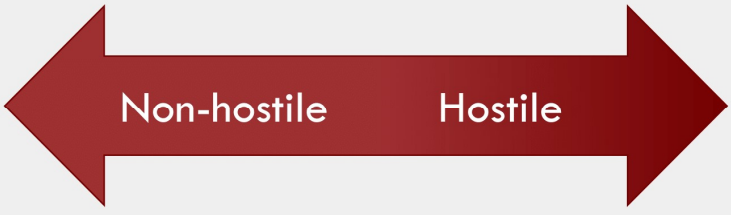
ANALYTICAL FRAMEWORK

- Determinates of Risk:
  - Political Environment



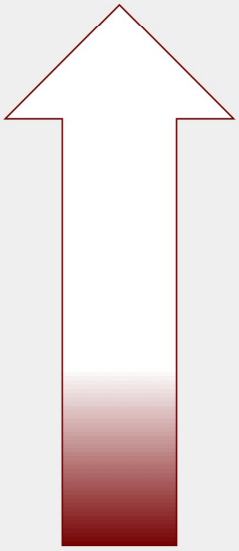
POLITICAL ENVIRONMENT

- This factor lies outside a combatant commander's control.



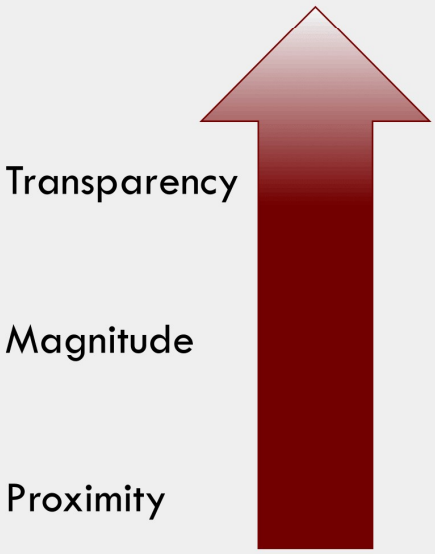
ANALYTICAL FRAMEWORK

- Determinates of Risk:
  - Political Environment
  - Threat Level of the Exercise



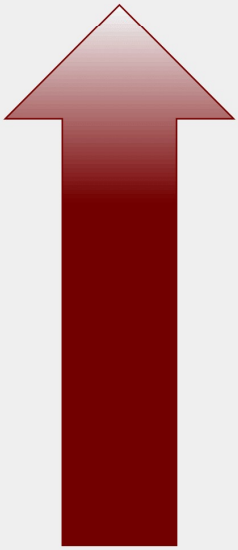
ANALYTICAL FRAMEWORK

- Determinates of Risk:
  - Political Environment
  - Threat Level of the Exercise

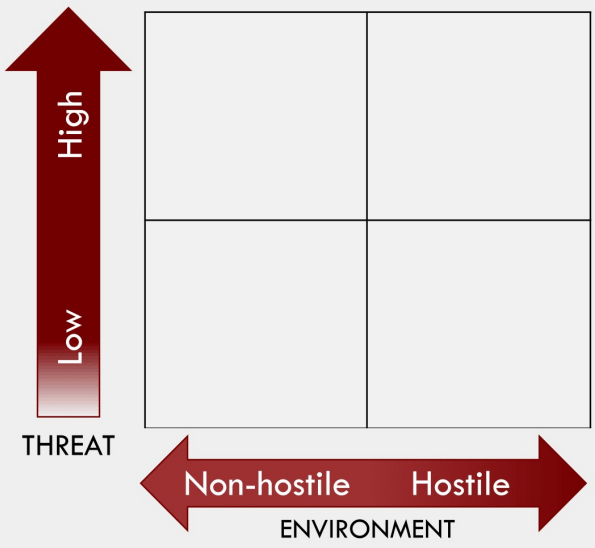


THREAT LEVEL OF THE EXERCISE

- This factor is within a combatant commander's control.



ANALYTICAL FRAMEWORK: Risk Matrix



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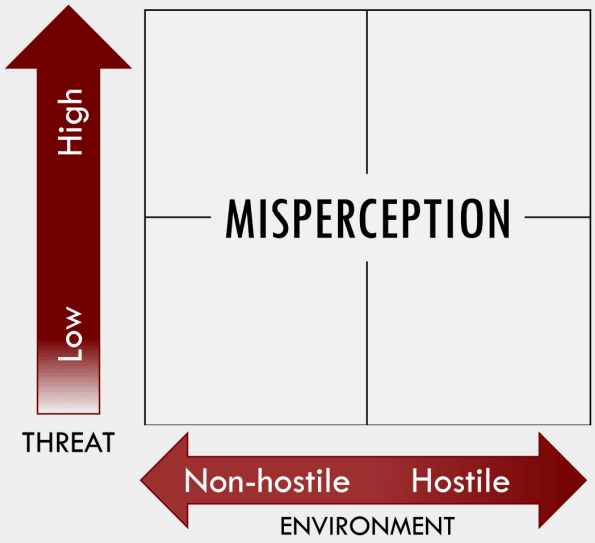
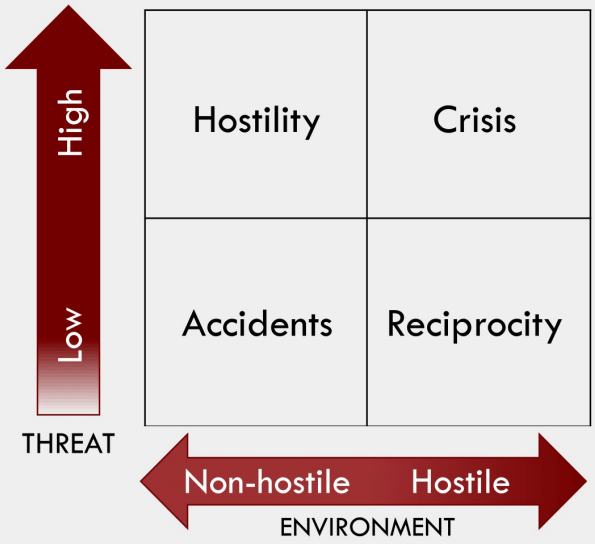
ANALYTICAL FRAMEWORK: Risk Matrix



ANALYTICAL FRAMEWORK: Risk Matrix



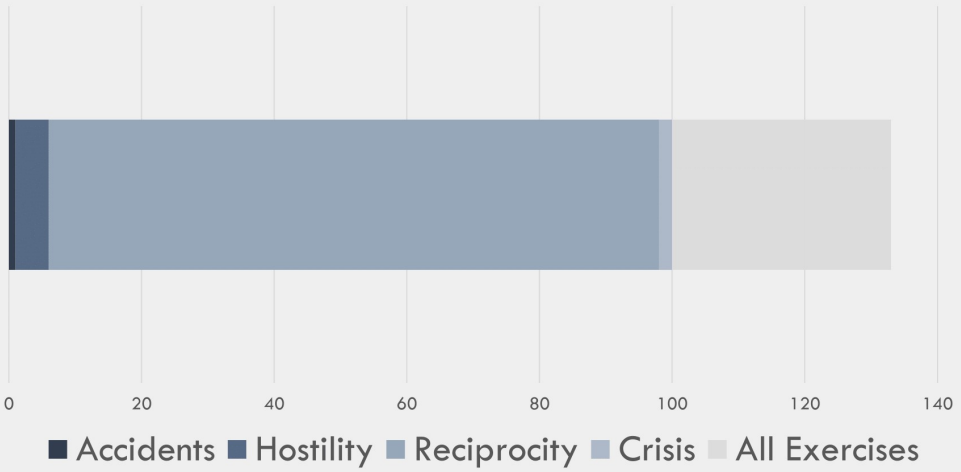
ANALYTICAL FRAMEWORK: Dataset

- First-cut Military Exercises Dataset:
  - Imperfect sample of large military exercises
    - Based on the availability of data
    - Does not include shows of force, missile tests, etc.
  - Time Span: 1972-2016
  - Cases: 200+

ANALYTICAL FRAMEWORK: Dataset

- Purpose of the dataset:
  - Determine risks of military exercises
  - Test plausibility and utility of framework
  - Sampling source
  - Examine major trends

ANALYTICAL FRAMEWORK: Dataset



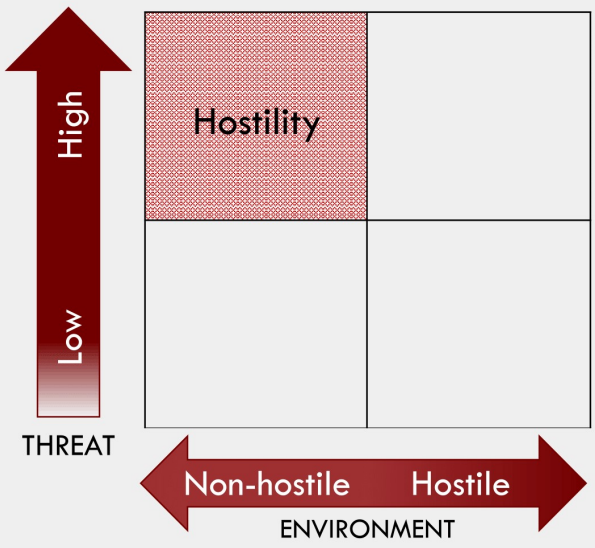
ANALYTICAL FRAMEWORK: Dataset

Exercise	Month	Year	Duration	Country A (Running)	Country B (Adversary)	Proximity	Proximity Rank	Force Mix	Force Size (Number)	Magnitude Rank	Transparency	Threat Level of Exercise	Political Environment	Predicted Box	Observable Outcome
Cold Response Feb 16	2	2016	33d	NATO	Russia	Central Norway	Med	All arms	15,000	High	Observers	High	Tense	Crisis	Reciprocity
Trident Juncture 15	10	2015		NATO	Russia	Iberian Peninsula	Low	All arms	36,000	High	Long Notice	Med	Tense	Reciprocity	Reciprocity
Immediate Response 15	9	2015	14d	US, PfP	Russia	Croatia, Slovenia	Med	CPX, Ground	1,400	Low	Long Notice	Med	Tense	Reciprocity	Reciprocity
Combat Commonwealth 15	8	2015		Russia	NATO	Astrakhan Region,	High	Ground, Air Defense	1,000	Low	Long Notice	Med	Tense	Reciprocity	Reciprocity

AGENDA

- Overview of Problem
- Analytical Framework
- Historical Case Studies
- Recommendations
- Conclusion

HOSTILITY: Steadfast Jazz 2013



HOSTILITY: Steadfast Jazz 2013

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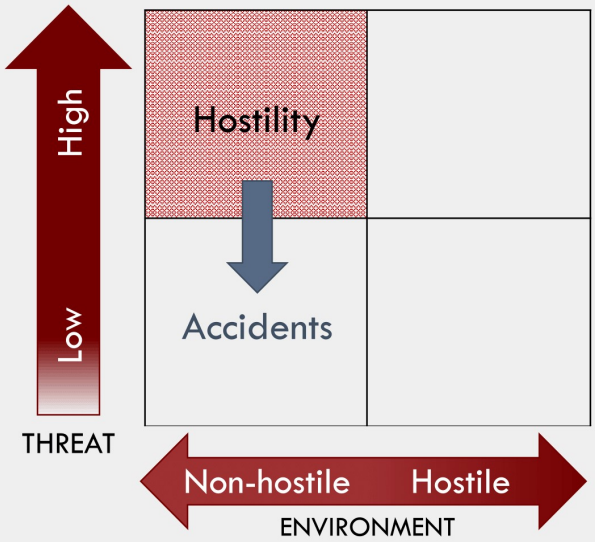
HOSTILITY: Steadfast Jazz 2013



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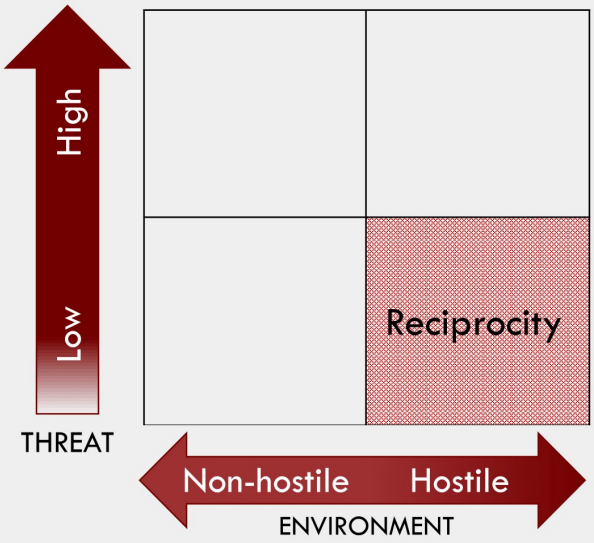
RECIPROCITY: Immediate Response 2008



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RECIPROCITY: Immediate Response 2008

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RECIPROCAL ACTION: Kavkaz 2008

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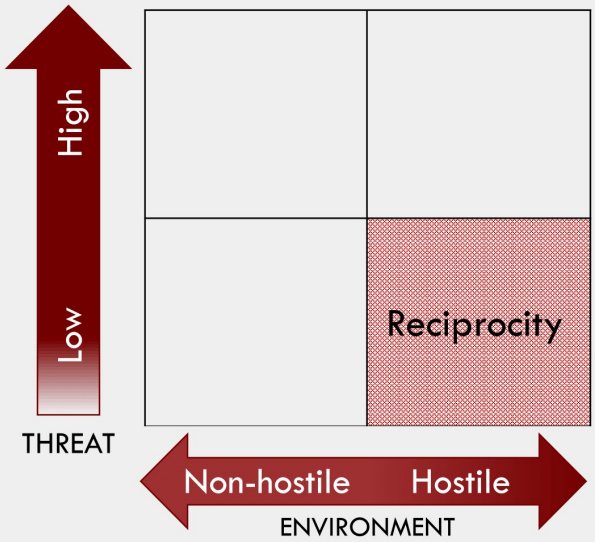
RECIPROCITY: Immediate Response 2008



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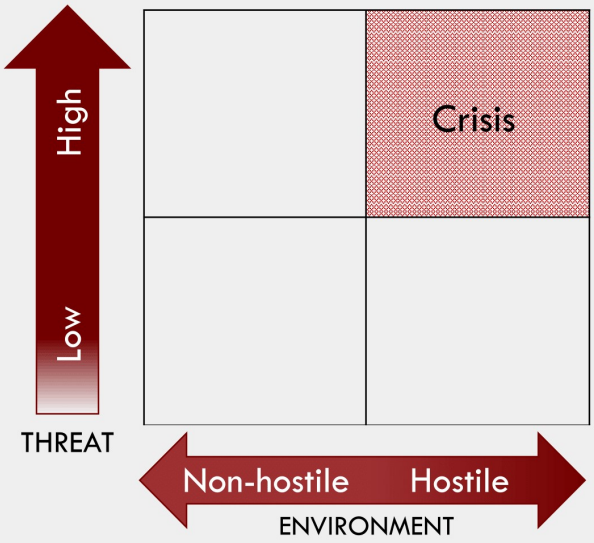
CRISIS: Operation Brasstacks 1986



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CRISIS: Operation Brasstacks 1986

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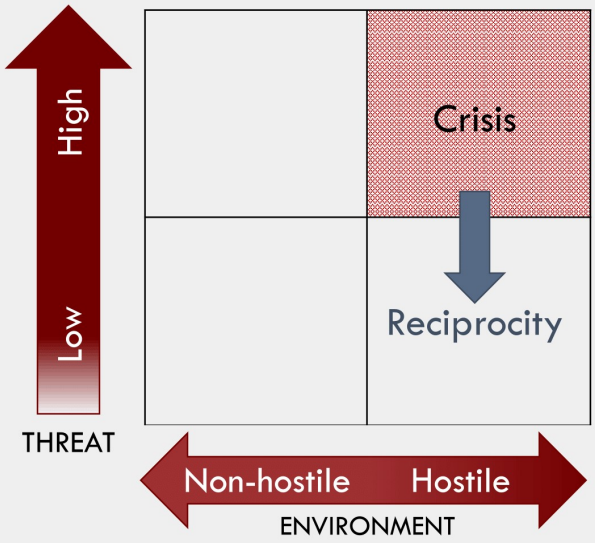
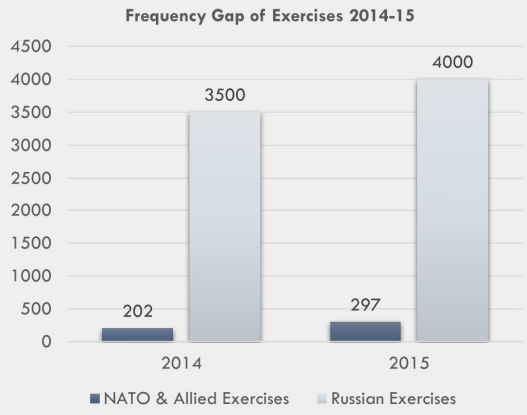
CRISIS: Operation Brasstacks 1986



TRENDS: Russia

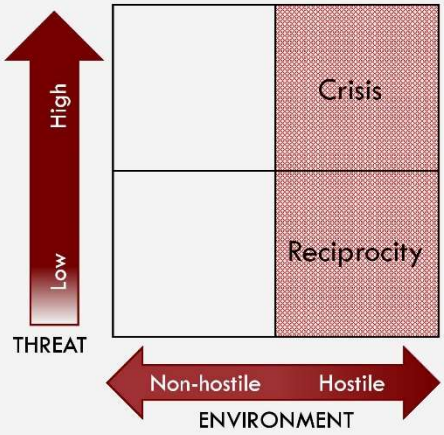
Source: Bush School Dataset



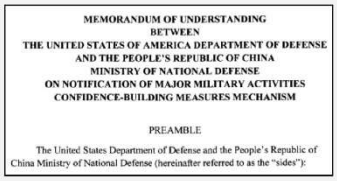
Source: The Atlantic Council

TRENDS: Russia

- Russia
  - Limited transparency (CFE)
  - Close proximity
  - Force mix (Ground)



TRENDS: China

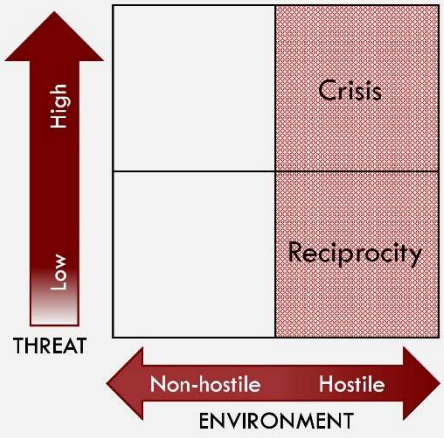


MEMORANDUM OF UNDERSTANDING
BETWEEN
THE UNITED STATES OF AMERICA DEPARTMENT OF DEFENSE
AND THE PEOPLE'S REPUBLIC OF CHINA
MINISTRY OF NATIONAL DEFENSE
ON NOTIFICATION OF MAJOR MILITARY ACTIVITIES
CONFIDENCE-BUILDING MEASURES MECHANISM

PREAMBLE

The United States Department of Defense and the People's Republic of China Ministry of National Defense (hereinafter referred to as the "sides"):

- China
  - Transparency (MoU)
  - Distant proximity
  - Force mix (Naval)



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RECOMMENDATIONS

- Consider the political environment, including significant events
- Recognize and address the potential for misperception
- Calibrate exercises to reduce risk
  - Alter the proximity, magnitude, or transparency
- Balance risk of misperception with need for deterrence and assurance

AGENDA

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FUTURE RESEARCH

- Expand database
  - Brigade/Regiment-level readiness reporting
- Examine effects of canceled exercises
- Investigate risks arising from cyber, space, and nuclear exercises

CONCLUSION

- Military exercises create risks
  - Political environment
  - Threat level of the exercise
- Risk Matrix allows for better cost-benefit analysis
  - Risk mitigation is not always feasible, given specific missions

QUESTIONS

Committed to realizing the noble vision of its namesake, George Bush, 41st President of the United States, the mission of the Bush School of Government and Public Service is to educate principled leaders in public and international affairs, conduct research, and perform service.

Capstone projects at the Bush School of Government and Public Service at Texas A&M University are integrative, team-based, applied research projects required of all students. Led by a faculty member on behalf of a client agency, these projects require students to think independently, frame and analyze issues, and apply their academic knowledge and skills.

Capstone students have broad discretion in defining the project, allocating tasks, communicating with the client, and establishing and ensuring deadlines using effective communication, teamwork, and collaborative learning strategies. The projects fully prepare students to supervise, conduct, and evaluate large-scale public policy research and culminate in a formal, written report and oral presentation to the client.

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