Understanding Russian Coercive Signaling
In recent years, Russia frequently seemed to use its military to send signals to the United States and its allies. However, it often has been unclear what, exactly, Russia seeks to convey with these signaling efforts. Indeed, there has been little systematic effort to study Russian actions that could be considered signaling. And we know relatively little about how the Russian strategic community conceives of signaling in its confrontation with the West.

This report provides the first comprehensive assessment of Russian coercive signaling—military actions, short of the use of kinetic force, that have the apparent intention of compelling, deterring, or confronting an adversary via threat. The objective is to better understand Moscow’s motives and thus provide a framework to better interpret its signals in the future.

Human Subject Protections (HSP) protocols were used in this study in accordance with the appropriate statutes and Department of Defense (DoD) regulations governing HSP. Additionally, the views of the sources rendered anonymous by HSP are solely their own and do not represent the official policy or position of DoD or the U.S. government.

The research reported here was completed in May 2021 and underwent security review with the sponsor and the Defense Office of Prepublication and Security Review before public release.
Acknowledgments

The authors would like to thank the Russia Strategic Initiative (RSI) at U.S. European Command and RSI director Ken Stolworthy for sponsoring this project and affording us the latitude to conduct this wide-ranging research. At RAND, we had fantastic support from the leaders of RAND’s engagement with RSI, Mark Cozad and Dara Massicot (who was dual-hatted as a researcher on this report), and Mike Spirtas, associate director of the NSRD International Security and Defense Policy Center.

We are grateful to Emma Claire Foley of Global Zero and Paul Normolle of the University of Pittsburgh for sharing their respective data on Russian military incidents. Several current and former U.S. and NATO officials, who preferred to remain anonymous, helped us understand these interactions from a first-hand perspective. Finally, we owe a debt of gratitude to Celeste Wallander and Thomas Szayna, whose reviews of this report challenged our thinking in positive ways and greatly improved the final product.
Russia consistently has engaged in coercive signaling vis-à-vis the United States and its allies in recent years. Moscow regularly uses limited military actions—far short of direct aggression but often creating escalatory risks—that have caused concern and consternation in Western capitals. Publicly released footage of close encounters in the air and on the seas and announcements of intercepts of Russian heavy bombers near U.S. shores have created the impression of a coordinated campaign of assertive behavior. However, it is far from clear what exactly Russia wants to convey with these signaling efforts because Moscow almost never explains its actions and there has been no systematic effort to study relevant Russian activities. And we know relatively little about how the Russian strategic community conceives of the role of signaling in its ongoing confrontation with the West. Given the now-regular contact between U.S. and allied forces and their Russian counterparts, it is crucial to fill this gap. This report represents the first comprehensive attempt to do so.

Our research approach involved several lines of effort and different methodological tools. We reviewed the political science literature on signaling, brinksmanship, and other relevant concepts to develop an analytical framework. We also conducted interviews with U.S. and allied government officials to better understand the real-world nuances of these military-to-military interactions. Drawing on the literature review and insights from these discussions, we devised several hypotheses regarding the objectives that drive Russia’s actions and the expected behaviors associated with each hypothesis. The primary hypotheses presume that Russia is engaged in one form or another of what we term coercive signaling. Signaling is a broad term that covers a variety of actions, including statements and diplomatic agreements, that states use to communicate with one another. Coercive signaling refers to military actions short of the actual use of force that are intended to affect adversary behavior. Such limited military actions can be important signals to demonstrate a state’s commitment to an issue. We also posit addi-
tional or alternative hypotheses to explain Russian activities that suggest that Moscow is not, in fact, engaged in coercive signaling. These hypotheses are presented in Table S.1.

We then evaluated these hypotheses using three methods: an examination of Russian strategic writing and leadership statements on the topic, a large-\(N\) quantitative modeling effort; and qualitative case studies of specific incidents.

To better appreciate the drivers of Moscow’s behavior, we analyzed how Russian military strategists and senior decisionmakers write and speak about relevant concepts and events. There is no equivalent for the term signaling in Russian military science. However, the Russian strategic community has elaborated on related concepts in recent years that shed important

<table>
<thead>
<tr>
<th>Hypothesis</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>H1a</td>
<td>Tactical compellence: Compel a change to ongoing military action.</td>
</tr>
<tr>
<td>H1b</td>
<td>Operational compellence: Compel a change in a pattern of behavior, usually to dissuade further action.</td>
</tr>
<tr>
<td>H1c</td>
<td>Coercive diplomacy: Force a negotiation related to the ongoing activity.</td>
</tr>
<tr>
<td>H2</td>
<td>Deter possible adversary aggression.</td>
</tr>
<tr>
<td>H3</td>
<td>Status signaling: Force an adversary to acknowledge Russia’s status.</td>
</tr>
<tr>
<td>AH1</td>
<td>Russian pilots or captains are acting unprofessionally or making decisions without authorization.</td>
</tr>
<tr>
<td>AH2</td>
<td>Any increase in incidents is purely a function of the revival in Russia’s military capabilities.</td>
</tr>
<tr>
<td>AH3</td>
<td>These incidents are artificial attempts to stoke tensions with the West to create a rally-around-the-flag effect and bolster President Vladimir Putin’s ratings.</td>
</tr>
<tr>
<td>AH4</td>
<td>Russia is seeking to provoke a U.S. military response to gather better intelligence on U.S. capabilities, concepts of operations (CONOPs), or readiness.</td>
</tr>
</tbody>
</table>

NOTE: Compellence refers to the use of force (or threat of the use of force) to force an adversary to take an action or to stop taking an action.
light on the country’s actions. We examined several of these concepts, such as *sderzhivanie* (actions taken to cause the adversary restraint) and demonstrational actions. Our analysis provides a window into the intellectual framework of the Russian military’s coercive signaling activities. It shows important grounding for several of our hypotheses in Russian strategic thought. We also explored Moscow’s analysis of U.S. signaling activities for a different angle on Russian thinking on this issue.

To gain better analytical purchase on possible patterns of Russian coercive signaling, we used statistical modeling techniques to analyze several original data sets that we created for this report. The first data set covers more than 1,000 possible Russian coercive signaling incidents over the period of 2010–2018. We evaluated the incidents to ensure that they met our criteria for coercive signaling and then coded them according to a wide variety of relevant metrics, from the nature of the forces involved (e.g., type of aircraft) to the behavior during the event (e.g., whether the aircraft was armed). We created three additional data sets of relevant U.S. and allied activities to test for possible linkages with patterns of Russian behavior. We then used these and other data to evaluate our hypotheses about Russian motives.

To provide a more nuanced understanding of Moscow’s motives, we conducted detailed qualitative case studies of several prominent coercive signaling incidents. We chose one or two incidents from the three categories of interactions between U.S. and Russian forces: air-air (both sides’ aircraft); air-surface (i.e., a Russian aircraft and a U.S. surface ship); and surface-surface (both sides’ ships). Using all available open sources, we documented these incidents in detail. We then assessed which of the posited hypotheses best accounted for the actions observed.

**Findings**

As a general matter, we found solid empirical grounds to make judgments about Russia’s motives. Russian strategy calls for activities consistent with tactical compellence, operational compellence, coercive diplomacy, and deterrence. Russian military strategists have developed an all-encompassing concept of strategic *sderzhivanie*, which rationalizes a wide variety of actions to coerce an adversary to demonstrate restraint. That coercion can come
in the form of H1b-like compellence and H2-type deterrence. The operational concepts of *sderzhivayushchie deistviya* (actions to cause restraint) and *demonstratsionnye deistviya* (demonstrational actions) indicate that the military thinks in the terms of H1b and H2 objectives and links compellence with diplomatic processes, consistent with H1c. The tactical use of the term *prinuzhdenie* (in this context, best translated as compellence) suggests that standing instructions to use coercive signaling as a means of compelling an adversary’s military forces to change an ongoing behavior do exist (H1a) and can be carried out when circumstances demand. Russian portrayals of relevant U.S. activities suggest that Moscow expects H2-type deterrence signaling to follow regular, predictable patterns.

The quantitative analysis strongly supports the operational compellence and deterrence hypotheses and provides some support for coercive diplomacy. Drawing on dozens of statistical tests, we found by far the most consistent support for H1b, i.e., that Russian forces are acting in a manner that is aimed at compelling a change in patterns of specific U.S. and allied behavior. Russian assertive incidents occurred in the same domains and geographic regions as patterns of U.S. and allied behavior that Moscow finds objectionable. Russia’s actions tend to be symmetrical responses that are narrowly tailored to affect the patterns that it seeks to change. Specifically, the data show that as the number of U.S. intelligence, surveillance, and reconnaissance and bomber flights in Europe increases, so do the expected number of assertive Russian incidents in the air. The average number of assertive Russian maritime incidents in the Black or Baltic Seas in a given month is seven times higher when a U.S. Aegis-capable ship is present there. When the United States or its North Atlantic Treaty Organization (NATO) allies conducted exercises in countries bordering Russia, there was a three-fold increase in the average number of assertive Russian snap exercises, defined as those that took place in regions on the country’s western borders. Although there is a paucity of evidence to generate robust findings in support of coercive diplomacy (H1c), the evidence that we do have is suggestive of a connection between coercive signaling and diplomatic overtures.

Our expectations for behavior consistent with classic deterrence (H2) were also borne out in statistical testing. Classic deterrence activities—long-range aviation (LRA) flights and routine exercises—should remain steady over time if they are not being used for more-pointed geopolitical or mili-
Summary

tary signaling. Indeed, that expectation is borne out in the data. Specifically, the continuity before and after the watershed year of 2014 suggests that Russia did not use these activities to signal greater discontent with Western policies, for example, on sanctions. This stability over time is consistent with a general deterrence message, which was equally relevant before relations worsened that year.

The statistical results do not provide empirical support for status signaling (H3) because cross-domain and all-domain linkages are largely absent. The patterns we identified in support of operational compellence (H1b) contradict the unauthorized behavior hypothesis (AH1) or at least systematic unauthorized behavior because they are not random. In the air domain, if assertive incidents were the product of individual pilots’ decisions, we would expect to see a decline in the rate of U.S. flights encountering assertive Russian activity. What we saw is the opposite—a close connection between U.S. activity and Russian assertiveness. The modeling also does not bear out robust linkages with Russian military capacity improvements (AH2). For example, a steady increase in pilot flight hours over the past decade—a proxy for capability—appeared to have no statistically meaningful relationship with air-to-air assertive signaling. Finally, the statistical analysis provides some evidence to contradict rally-around-the-flag motivations (AH3): We saw that increases in Putin’s approval rating are associated with more assertive incidents in the following month. We would have expected to see more such incidents follow a decline in his rating if assertive incidents were being used to “wag the dog.”

The case studies demonstrated clear-cut evidence of tactical (H1a) and operational (H1b) compellence and more-ambiguous findings about status signaling (H3). The air-surface cases that we examined, both relating to Russian aerial signaling of the same U.S. surface ship (in different seas and with a two-year time lag), were both cases of compellence. However, in one instance, the Russian actions were not plausibly intended to disrupt the ship’s operations—and thus were more likely an attempt to compel a change in future behavior (H1b)—whereas the Russian activity was disruptive to the U.S. ship’s activities in the other case (H1a). The same can be said of the two air-air cases, which were assertive Russian intercepts of the same U.S. aircraft type on the same day. In one case, we can say almost for certain that the Russian pilots had orders to disrupt the U.S. flight to cause it to change
course (tactical compellence, H1a); in the second case, there was no such attempt (operational compellence, H1b). By contrast, the surface-surface cases, which occurred far away from Russian shores, were not responding to any particular U.S. activity. Status signaling (H3) or unauthorized behavior (AH1) seem to be more likely explanations. We did not see any signs of intelligence collection–based provocations (AH4) in the cases.

Table S.2 summarizes our findings.

It should be noted that the nature of the findings of the analysis of Russian strategic writings differs from that of the findings of the quantitative and qualitative evaluations. Whereas the latter can both buttress and undermine the validity of the hypotheses, Russian strategy can only show support; the absence of evidence for a hypothesis in Russian thinking is not dispositive. Moreover, the support such evidence provides differs as well; it can confirm that Russian strategists think in similar terms but does not necessarily speak to the drivers of particular Russian actions.

**Implications**

The following implications emerge from our analysis:

- **Much of the assertive, dangerous, or unsafe Russian activity appears directed at shaping patterns of ongoing U.S. or allied behavior.** Such activity is almost by definition responsive, not proactive. Moscow appears to be using coercive signals to send targeted compellent messages regarding activities that it finds problematic. It should be emphasized that this is an empirical research finding; it is neither a normative assessment nor a policy prescription.
- **These compellent signals are often linked to particular U.S. and allied activities.**
  - U.S. or NATO exercises in states that border Russia produce a statistically significant increase in Russian snap exercises on its Western frontiers.
  - The average number of Russian assertive maritime incidents in the Black or Baltic Seas in a given month is seven times higher when an Aegis-capable U.S. ship is present there.
# TABLE S.2
## Findings Summary

<table>
<thead>
<tr>
<th>Hypothesis</th>
<th>Description</th>
<th>Findings</th>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>H1a</td>
<td>Tactical compellence: Compel a change to ongoing military action.</td>
<td>Strong support</td>
<td>Strategy, case studies</td>
</tr>
<tr>
<td>H1b</td>
<td>Operational compellence: Compel a change in a pattern of behavior, usually to dissuade further action.</td>
<td>Strong support</td>
<td>Strategy, quantitative analysis, case studies</td>
</tr>
<tr>
<td>H1c</td>
<td>Coercive diplomacy: Force a negotiation related to the ongoing activity.</td>
<td>Moderate support</td>
<td>Strategy, quantitative analysis</td>
</tr>
<tr>
<td>H2</td>
<td>Deter possible adversary aggression.</td>
<td>Strong support</td>
<td>Strategy, quantitative analysis</td>
</tr>
<tr>
<td>H3</td>
<td>Status signaling: Force an adversary to acknowledge Russia’s status.</td>
<td>Moderate support</td>
<td>Quantitative analysis (no support), case studies (moderate support)</td>
</tr>
<tr>
<td>AH1</td>
<td>Russian pilots or captains are acting unprofessionally or making decisions without authorization.</td>
<td>Moderate support</td>
<td>Quantitative analysis (no support), case studies (moderate support)</td>
</tr>
<tr>
<td>AH2</td>
<td>Any increase in Russian incidents is purely a function of the revival in Russia’s military capabilities.</td>
<td>No support*</td>
<td>Quantitative analysis</td>
</tr>
<tr>
<td>AH3</td>
<td>These incidents are artificial attempts to stoke tensions with the West to create a rally-around-the-flag effect and bolster Putin’s ratings.</td>
<td>No support</td>
<td>Quantitative analysis</td>
</tr>
<tr>
<td>AH4</td>
<td>Provoke a U.S. military response to gather better intelligence on U.S. capabilities, CONOPs, or readiness.</td>
<td>No support</td>
<td>Case studies</td>
</tr>
</tbody>
</table>

NOTE: * There was one test that showed some support, but it was not substantively significant.
Most proactive activities (LRA flights, routine exercises) are generally used for broad deterrence messaging and do not pose immediate safety concerns. Russia’s deterrent signaling appears to be deliberately predictable.

There is thus a line between the Russian practices of compellence and deterrence that emerges from our study. Compellent signals are usually a response to U.S. or allied behavior that Moscow finds problematic, generally along Russia’s periphery; these signals can be quite belligerent. Deterrent signals are generally predictable and do not entail brinksmanship.

The Russian Navy appears to be only engaged in signaling beyond Russia’s immediate periphery. It is difficult to identify concrete military objectives behind this activity. It might be status signaling, but captains acting without authorization is an equally plausible explanation.

The evidence and analysis presented in this report also offer important insights that can help U.S. efforts to interpret future Russian coercive signaling activities. Figures in Chapter 6 provide guides to evaluate such activities.
## Contents

About This Report ............................................................... iii  
Summary .............................................................................. v  

**CHAPTER ONE**  
Introduction ................................................................. 1  
Research Questions ......................................................... 2  
Research Approach ......................................................... 2  
Report Structure ............................................................. 4  

**CHAPTER TWO**  
Defining Coercive Signaling and Identifying Possible Drivers ........ 5  
Relevant Concepts from the International Relations Literature ........ 5  
Empirical Analysis of Recent Russian Behavior .................. 16  
Parsing Russia’s Possible Objectives: Hypotheses .............. 23  
Evaluating the Hypotheses ............................................ 32  

**CHAPTER THREE**  
Russian Strategic Thinking on Signaling ................................. 33  
Introduction ...................................................................... 33  
Relevant Russian Concepts ........................................... 34  
Russian Views on U.S. Signaling Activities .......................... 39  
Conclusion ........................................................................ 43  

**CHAPTER FOUR**  
Statistical Analysis of Russian Coercive Signaling .................. 45  
Introduction ...................................................................... 45  
Data Collection and Availability ..................................... 45  
Modeling ........................................................................... 56  
Hypothesis Testing ........................................................... 57  
Conclusion ........................................................................ 79
CHAPTER FIVE
Case Studies ................................................................. 83
Air-Surface ................................................................. 84
Surface-Surface ......................................................... 90
Air-Air ................................................................. 95
Conclusion ......................................................... 102

CHAPTER SIX
Conclusion ............................................................. 105
Findings ............................................................. 105
Implications ..................................................... 109

APPENDIX
Additional Statistical Data ............................................. 113
Abbreviations .......................................................... 135
References .......................................................... 137
Figures

2.1. National Airspace in the Baltic Sea Region ............................. 20
2.2. Monthly Distribution of 2010–2018 Russian Coercive Signaling Incidents ................................................................. 57
4.1. Predicted Russian Assertive Air Incidents in Europe, by Number of U.S. Flights .......................................................... 61
4.2. Correlation Between Russian Naval Incidents and U.S. Navy Activity in Europe ..................................................... 62
4.3. Russian Exercises and U.S. or Allied Exercises in Europe ...... 64
4.4. Baltic Sea Region Air Incidents and Russia’s July 2016 Diplomatic Overture ................................................................. 66
4.5. Monthly Distribution of 2010–2018 Russian Coercive Signaling Incidents ................................................................. 57
4.6. Russian Long-Range Aviation Flights over Time ................. 68
4.7. Post-2014 Change in Russian Deterrent Activities .......... 69
4.8. Cross-Domain Correlations Between Air, Sea, and Exercise Activity and Russian Assertive Incidents ......................... 71
4.9. U.S. Flights in Europe and All-Domain Russian Assertiveness ................................................................. 73
4.10. Effect of Blue or Green Naval and Ground Activity on Russian All-Domain Assertiveness ........................................... 74
4.11. Rate of U.S. Flights Encountering Assertive Russian Behavior .................................................................................... 75
4.12. Putin’s Approval Rating and Russian Assertive Incidents ...... 79
5.1. Russian Su-24 Low-Altitude Pass of USS Donald Cook in 2016.................................................................................. 86
5.2. Russian KA-27 Circling Near the USS Donald Cook in 2016 .... 87
5.3. Russian Sailors Sunbathing on the Deck of the Admiral Vinogradov ................................................................. 92
5.4. Russian Su-27 Approaching U.S. B-52 in the Black Sea ...... 98
5.5. Russian Su-27 Flying Across the Nose of a U.S. B-52 ......... 98
5.7. Map of the Intercept in the Baltic .......................................... 101
6.1. Interpreting Russian Coercive Signals: Ground Exercises .... 110
6.2. Interpreting Russian Coercive Signals: U.S. or Allied Intercept of Russian Aircraft ......................................................... 111
6.3. Interpreting Russian Coercive Signals: Russian Intercept of U.S. or Allied Aircraft ........................................ 111
6.4. Interpreting Russian Coercive Signals: Maritime Incidents... 112

Tables

S.1. Hypotheses Summary .................................................. vi
S.2. Findings Summary ..................................................... xi
2.1. Hypotheses Summary .................................................. 31
4.1. Sources for Data on Russian Coercive Signaling, 2010–2018 .... 47
4.2. Selected Examples of Data Collected .................................. 49
4.3. Classification Structure for Assertive Air and Maritime Incidents .................................................. 50
4.4. Breakdown of Incidents by Domain and Assertiveness ......... 51
4.5. U.S. Flights in Europe and Assertive Russian Air Incidents .... 60
4.6. Russian Defense Spending, Crude Oil Price, and Global Russian Incidents .................................................. 77
4.7. Summary of Findings .................................................... 81
5.1. Hypothesis Testing: Air-Surface Incidents ......................... 90
5.2. Hypothesis Testing: Surface-Surface Incidents ................ 96
5.3. Hypothesis Testing: Air-Air Incidents ............................ 103
6.1. Findings Summary ..................................................... 106
A.1. Classification of Force Sizes .......................................... 113
A.2. Russian Assertive Sea Incidents and U.S. Naval Activity ....... 114
A.3. Russian Assertive Sea Incidents and U.S. Aegis Presence ...... 115
A.4. Russian Assertive Sea Incidents and U.S. Ships in Black and Baltic Seas .................................................. 116
A.5. Russian Exercises and Green or Blue Exercises ................. 117
A.6. Russian Snap Exercises and Disaggregated Green or Blue Exercises .................................................. 118
A.7. Russian Assertive Snap Exercises and Disaggregated Green or Blue Exercises .................................................. 120
A.8. Russian Long-Range Aviation Flights and U.S. Bomber Flights .................................................. 122
A.9. Russian Routine Exercises or Long-Range Aviation Flights Post-2014 .................................................. 123
A.10. Russian Assertive Sea Incidents and U.S. Flights .............. 124
A.11. Russian Assertive Air Incidents and Number of U.S. Ships in Black and Baltic Seas ........................................ 125
A.12. Russian Snap Exercises and U.S. Flights .......................... 126
A.13. Russian Assertive Air Incidents Out of Geographic Area and U.S. Flights in Europe .......................... 127
A.14. Russian Assertive Sea Incidents in the Pacific and the Number of U.S. Ships in the Black and Baltic Seas .................... 128
A.15. All Russian Assertive Incidents and U.S. Flights............... 129
A.16. All Russian Assertive Incidents and Number of U.S. Ships in the Black and Baltic Seas .......................... 130
A.17. All Russian Assertive Incidents and Sensitive Exercises ....... 131
A.18. Russian Assertive Air Incidents and Russian Tactical Flight Training Hours ........................................ 132
A.19. All Russian Assertive Incidents and Putin’s Approval Rating. 133
CHAPTER ONE

Introduction

The research for this report was conducted in calendar year 2020. The draft was completed in March 2021.

Russia has consistently engaged in coercive signaling vis-à-vis the United States and its allies in recent years. Moscow regularly uses limited military actions—far short of direct aggression but often creating escalatory risks—that have caused concern and consternation in Western capitals. Publicly released footage of close encounters in the air and on the seas or announcements of intercepts of Russian heavy bombers near U.S. shores has created the impression of a coordinated campaign of assertive behavior. However, it is far from clear what, exactly, Russia wants to convey with these signaling efforts because Moscow almost never explains its actions and there has been no systematic effort to study relevant Russian activities. And we know relatively little about how the Russian strategic community conceives of the role of signaling in its ongoing confrontation with the West. Given the now-regular contact between U.S. and allied forces and their Russian counterparts, it is crucial to fill this gap.

To do so, we systemically analyze Russian behavior, drawing on political science literature, the history of Cold War-era incidents, and interviews with U.S. officials to generate a series of hypotheses about Moscow’s motives. The primary hypotheses presume that Russia is engaged in one form or another of what we term coercive signaling. Signaling is a broad term covering a variety of actions, including statements and diplomatic agreements, that states use to communicate with one another. Coercive signaling refers to military actions short of the actual use of force that are intended to affect adversary behavior. Such limited military actions can be important signals to demonstrate a state’s commitment to an issue. We also consider
the possibility that Russian behavior is not, in fact, coercive signaling, and test several alternative explanations.

Different understandings of Moscow’s objectives could lead to dramatically divergent interpretations of events. If Russia is, in fact, engaged in a coercive signaling campaign, an assertive intercept of a U.S. bomber flight, for example, is more likely to be an attempt to send a message and less likely the consequence of an individual Russian pilot’s reckless or unprofessional behavior. If there is no evidence that Moscow is engaged in coercive signaling, we need not search for policy significance in such intercepts.

As U.S. European Command (EUCOM) both evaluates and develops responses to assertive Russian actions, a better understanding of what drives those behaviors is crucial. Without such an understanding, there are greater dangers both of underreacting, and thus enabling problematic behaviors, or overreacting and needlessly escalating tensions or even increasing the risks of a clash. This report is intended to provide both original, empirically grounded research and practical guidelines for assessing future events.

Research Questions

This report considers the following key research questions:

• What are the primary drivers of Russia’s coercive signaling behavior?
• Are there trends or patterns in this behavior?
• How do Russian military strategists think about signaling?
• How can the United States best interpret future Russian actions?

Research Approach

Our research approach involved several lines of effort and different methodological tools. We reviewed the political science literature on signaling, brinksmanship, and other relevant concepts to develop an analytical framework. We also conducted interviews with several U.S. and allied government officials to better understand the real-world nuances of these military-to-military interactions. Drawing on the literature review and insights from these discussions, we devised several hypotheses regarding the objectives that drive Russia’s actions and the expected behaviors associated with each
hypothesis. We also posited additional or alternative hypotheses to explain Russian activities that suggest Moscow is not, in fact, engaged in coercive signaling. We then evaluated these hypotheses using three methods: an examination of Russian strategic writing and leadership statements on the topic, a large-$N$ quantitative modeling effort, and qualitative case studies of specific incidents. Finally, we leveraged the insights from these three cuts at past Russian actions to inform our understanding of future ones.

To the best of our knowledge, this is the first comprehensive analysis of the drivers of Moscow’s signaling behavior, and certainly the first that brings to bear close readings of Russian strategy, a quantitative examination of incidents (using statistical tools), and a qualitative study of these same phenomena (through case studies).

**Russian Strategy**

To better appreciate the drivers of Moscow’s behavior, we analyzed how Russian military strategists and senior decisionmakers write and speak about relevant concepts and events. There is no equivalent for the term *signaling* in Russian military science. However, the Russian strategic community has elaborated related concepts in recent years that shed important light on the country’s actions. We examine several of these concepts, such as *sderzhivanie* (actions taken to cause the adversary restraint) and demonstrational actions. Our analysis provides a window into the intellectual framework of the Russian military’s coercive signaling activities. It shows important grounding for several of our hypotheses in Russian strategic thought. We also explore Moscow’s analysis of U.S. signaling activities for a different angle on Russian thinking on this issue.

**Quantitative**

To gain better analytical purchase on possible patterns of Russian coercive signaling, we used statistical modeling techniques to analyze several original data sets that we created for this report. The first data set covers over 1,000 possible Russian coercive signaling incidents between 2010 and 2018. We evaluated the incidents to ensure that they met our criteria for coercive signaling, and then coded them according to a wide variety of relevant metrics, from the nature of the forces involved (e.g., type of aircraft) to the behavior during the event (e.g., whether the aircraft was armed). We cre-
ated three additional data sets of relevant U.S. and allied activities to test for possible linkages with patterns of Russian behavior. We then used these and other data to evaluate our hypotheses about Russian motives. This quantitative approach provided important results that both validated several hypotheses and called others into question.

Qualitative

To provide a more-nuanced understanding of Moscow’s motives, we conducted detailed qualitative case studies of several prominent coercive signaling incidents. We chose one or two incidents from the three categories of interactions between U.S. and Russian forces: air-air (both sides’ aircraft); air-surface (i.e., a Russian aircraft and a U.S. surface ship); and surface-surface (both sides’ ships). Using all available open sources, we documented these incidents in detail. We then assess which of the posited hypotheses best account for the actions observed.

Report Structure

Chapter Two of this report describes our analytical framework. In it, we review the international relations (IR) literature on signaling. We draw on relevant strands within it to elaborate the concept of coercive signaling. Chapter Two also provides a brief history of Cold War-era incidents that involved the United States and the Soviet Union (Union of Soviet Socialist Republics [USSR]), and offers an overview of post-2014 incidents, drawing on our interviews with officials. Looking at both the theory and the history, we elaborate five hypotheses and four alternative hypotheses regarding the drivers of Russian behavior. Chapter Three explores possible grounding for these hypotheses in Russian strategic thought. Chapter Four provides our quantitative analysis of Russian coercive signaling and describes our original data sets and coding efforts in detail and how we used them for statistical modeling to evaluate the hypotheses. We include our detailed modeling results in Appendix A. In Chapter Five, we assess three sets of signaling cases. Finally, Chapter Six summarizes our findings, extrapolates the implications for assessing future Russian signaling activities, and offers recommendations for policymakers.
Defining Coercive Signaling and Identifying Possible Drivers

In this chapter, we review the IR literature on signaling, why states signal, the types of signals they send, and how they send them. In doing so, we develop a concept of coercive signaling that refers to a set of militarized signaling behaviors that has, thus far, received disparate treatment from IR scholarship. We then review the literature on incidents involving the Soviet Union and Russia and the findings from our interviews with officials. The history provides valuable perspective on recent events; a review of analysis of those events suggests helpful distinctions to make when assessing Russian behavior. We draw on both strands in the third section, where we propose hypotheses regarding the drivers of Russian behavior.

Relevant Concepts from the International Relations Literature

Signals and Signaling

The IR literature on signaling is voluminous, and it includes some of the best-known names in recent decades of scholarship.¹ Signaling refers to a large category of behaviors that states use to demonstrate their preferences to each other. Signals, at their core, are statements or actions that convey

¹ These well-known names include Robert Jervis, Thomas Schelling, James Fearon, Robert Powell, Branislav Slantchev, Erik Gartzke, and others who are cited in this chapter.
information with the intent of influencing the receiver, and such signals can be sent in a variety of ways for a multitude of purposes.\textsuperscript{2}

Much of the signaling literature is focused on distinguishing between costly and costless signals. Costless signals can come from \textit{cheap talk}—statements that do not bind the hands of leadership, generate risk, sink costs, or otherwise constrain the options available to decisionmakers. Only costly signals—those that do bind hands or generate risk and costs—are seen by others as credible. A classic example of \textit{perceived} cheap talk is the messaging before the Chinese intervention in the Korean War. Then-Chairman Mao Zedong indicated that China would intervene in the conflict if U.S. forces crossed the 38th parallel. Other Chinese leaders attempted to use every private diplomatic means at their disposal to signal their intentions to the United States. However, the U.S. government took these messages as a bluff because they were not accompanied by detected movements of Chinese forces, shows of force, or public messages committing the Chinese leadership to intervention, which would put China’s reputation on the line. Washington thus proceeded to order U.S. forces to cross the 38th parallel in direct contravention to the privately signaled red line from the Chinese.\textsuperscript{3} The result, of course, was Chinese intervention and a prolonged conflict, partially because the signals from China were not seen as credible.

This example demonstrates that signaling is not simply a theoretical concept but a daily practical consideration for decisionmakers. Recipients of signals parse them to determine intent and motivation, along with the seriousness and severity of the message. In the aforementioned example, because such statements did not tie the Chinese leadership’s hands in any way, demonstrate commitment to the issue, or sink costs into the sending of the message (such as the movement of forces toward the border with Korea), they were not seen as a credible signal. Although recent literature has concluded that cheap talk can sometimes have a deterrent effect, our analysis here is focused on explanations of Russian military actions that potentially


have a signaling component. Signals sent through military action are more commonly understood as credible by actors on the international stage and thus are not generally subject to the same concerns about costs as speech acts are.

A classic alternative example is the Cuban Missile Crisis and the events that took place surrounding it, which were rife with signaling between the U.S. and Soviet governments. On both sides, the leadership tried to signal its commitment to the issue in a variety of ways. By deploying nuclear weapons to Cuba in the first place, the Soviet Union indicated that it was highly committed to the protection of its ally. By responding with maneuvers of U.S. forces, the John F. Kennedy administration indicated the importance with which it was treating the issue. By then making public statements demanding the removal of nuclear weapons from Cuba, Kennedy tied his own hands by making himself vulnerable to punishment from the voters if he did not deliver on that implied commitment.

Much of the signaling literature is concerned with related issues of levels of commitment to a stated objective. In this report, however, we are interested in better understanding signals when the motive is usually unstated and often unclear. For instance, what can we tell about the motivations behind Russian harassment of U.S. intelligence, surveillance, and reconnaissance (ISR) flights in the Baltic Sea compared with long-range aviation (LRA) flights off the coast of Alaska? Related concepts in political science offer additional insight into the drivers of such actions.

Signaling Resolve
The most critical types of signals for the purpose of this report are those that convey information about resolve. The concept of *resolve* refers to the value that states place on an issue and the costs they are willing to incur to

---


6 LRA is the branch of the Russian Aerospace Forces that is responsible for the strategic bomber fleet.
defend their interests relating to that issue. States can go to great lengths to signal to others the degree of their resolve and to bolster their reputations as resolute actors in the international arena. With a reputation as a resolute actor, a state’s threats are more likely to be seen as credible. Therefore, a reputation as a resolute actor comes with tangible benefits in dealing with other states. Because the actor with a reputation for resolve on a particular issue is taken more seriously by others, that actor will not need to always back up threats with actions. Other states know that this country is credible when it signals its intentions.

Leaders can credibly communicate their resolve in several ways. First, they can tie their own hands by creating audience costs that they will suffer domestically if they fail to follow through on a threat. Second, states take actions where the costs cannot be recouped, such as by mobilizing troops or conducting costly exercises. Engaging in such behavior demonstrates to the target of the signal that the sender is potentially willing to pay unnecessary costs to back its position on the underlying issue. Such a willingness demonstrates a degree of resolve that might be higher than that of a state’s opponent.

Third, and most importantly for this report, states can tie their hands by generating risk. As Thomas Schelling notes, it is the “sheer inability to predict the consequences of our actions and to keep things under control . . . that can intimidate the enemy.” States indicate what issues they are prepared to fight for in this way because there is a possibility of creating an escalatory spiral that leads to war by engaging in risky behavior. A state’s message that war is potentially preferable to the status quo generates a strong signal about its resolve in a given situation. Deliberate generation of risk can occur through such actions as putting military forces close to another state’s forces or giving command and control of nuclear weapons to field commanders and thus increasing the probability of nuclear

---


8 Fearon, 1994.


use. States can win in disputes without force simply by generating risks that their adversaries find prohibitive by playing games of “chicken.” Because states have an incentive to bluff, generating risk is a way of putting skin in the game so as to more clearly signal preferences.

This mechanism was used during the Cuban Missile Crisis. By implementing a naval quarantine of Cuba and attempting to stop Soviet shipments to the island, Kennedy engaged in activity that openly risked escalation and wider conflict. If U.S. vessels harmed Soviet personnel or ships, there would be a significant possibility of a military clash. When Soviet ships turned back, that was a signal that Moscow’s resolve was lesser than Washington’s, because the United States was more willing to accept higher degrees of risk in these encounters. As then–Secretary of State Dean Rusk stated during the events, “we were eyeball to eyeball and I think the other fellow just blinked.”

Brinkmanship, which Schelling defines as “manipulating the shared risk of war,” is a particular form of risk generation. Whereas the signaling literature examines cases when one side produces risk to signal commitment, brinkmanship refers to episodes when one side generates risks that affect both sides of a dispute; that is, potentially putting itself and its opponent in danger. Schelling uses the metaphor of two mountain climbers who are tied together at a cliff’s edge. Brinksmanship entails one “exploiting the danger” that he “may inadvertently go over the brink, dragging the other with him” to intimidate the other. There must be a degree of uncertainty about the cliff itself—perhaps it is not structurally sound—or the rationality of the climber

---


14 James M. Lindsay, “TWE Remembers: Eyeball to Eyeball and the Other Fellow Just Blinked (Cuban Missile Crisis, Day Nine),” blog post, Council on Foreign Relations, October 24, 2012.

approaching the edge to effectively intimidate. Applied to international conflict, effective brinksmanship involves taking an action to pressure or intimidate that creates “a genuine risk—a danger that can be appreciated—that the thing will blow up for reasons not fully under control.” If it were known that the situation could not get out of control, the action would be ineffective because it would neither “impose risk, nor demonstrate willingness to incur risk.” Writing in 1968, he uses an apt example for this study:

The purest real-life example I can think of in international affairs is “buzzing” an airplane, as in the Berlin air corridor or when a reconnaissance plane intrudes. The only danger is that of an unintended collision. The pilot who buzzes obviously wants no collision. (If he did, he could proceed to do it straightforwardly.) The danger is that he may not avoid accident, through mishandling his aircraft, or misjudging distance, or failure to anticipate the movements of his victim. He has to fly close enough, or recklessly enough, to create an appreciated risk that he may—probably won’t, but nevertheless may—fail in his mission and actually collide, to everyone’s chagrin including his own.17

Such observable threats that increase the probability of causing mutual harm—both planes would crash in a collision, after all—enhance the bargaining position of the initiating state, and they may allow that state to extract streams of benefits into the future by demonstrating high levels of resolve to the recipient of the threat.18 The impact of such signals are thus not confined to the immediate aftermath of the event, but they potentially change the way the sender and receiver relate to one another in the future. Because of this potential long-term benefit to the sender, brinkmanship can be an incredibly valuable signaling tool.

Brinksmanship can have this longer-term impact, but the effectiveness of any given signal is also partially determined by the past track record in episodes of coercive bargaining of the states involved. Clare and Danilovic

---

show that when a state faces multiple strategic rivals and has also failed in past disputes, it has an incentive to invest heavily in how resolved it is seen by those rivals. It does so by initiating episodes of signaling to rebuild its reputation for resolve that had been lost in past failures.\textsuperscript{19} This relates to status deficits, as discussed in the following section, but it also relates to the important concept of expectations. Signals of resolve are only informative if the observed behavior is different than what the recipient state had expected.\textsuperscript{20} This dynamic can take the form of showing resolve in circumstances when the state had not signaled resolve in the past, but it also can entail showing higher levels of resolve in situations when a response was expected. Expectations are particularly important for our purposes here because observers know that Russia has a track record of defending its perceived prerogatives along its periphery. Because of these expectations, for signals to be particularly meaningful in this region, Russia might need to act even more assertively than expected.

Although signaling resolve using nuclear weapons is perhaps the most-well-documented method of showing resolve, resolve can be demonstrated using risk generation all along the escalatory ladder. Powell has shown that risk-acceptant behavior at lower levels is a tactic that some use to avoid risk at higher levels of escalation.\textsuperscript{21} This is particularly true when the balance of capabilities is not in favor of the state that is creating the risk. In other words, when a state is at a disadvantage in terms of capabilities, to avoid escalation to an open conflict that the state knows it will lose, it signals its resolve at low levels of escalation to demonstrate that the balance of resolve is in its favor. By accepting greater risk, the weaker state seeks to negate its disadvantage in the balance of capabilities and guard its high-value interests while also avoiding a conflict that it knows is unlikely to win.

The signaling literature helps understand why and how states signal their resolve, which provides critical insight into how to conceptualize different types of Russian behavior. Russian actions that raise the risk of escalation or


\textsuperscript{21} Powell, 2015.
loss of life likely are signaling a high level of resolve. However, the literature does not answer the question of what Russian behavior might be signaling resolve about, which must be analyzed by looking at another body of literature. Of course, with certain high-profile episodes—like the Cuban Missile Crisis—the driver of the signaling behavior is clear, but that is not always the case.

Status and Reputation

In addition to signaling resolve over specific issues, states often send signals to assert their perceived status and prestige in the international system. Status and prestige serve important functions in building reputation because they enhance a state’s credibility and the effectiveness of its deterrence efforts. A state’s power derives from its position in relation to other states. Respect and status afford a state the ability to gain favorable outcomes in the international arena without having to resort to force to attain them. Prestige (high status) is not simply an aspiration but a concrete outcome that brings tangible benefits. Effective deterrence can emanate from high status, because of the higher level of skill, capacity, and competence the high-status state is assumed to possess.

Status signaling, then, is an act that demonstrates the initiating state’s standing in the international system. One mechanism to do so is by engaging in activities that other less-capable states are unable to conduct. For instance, visible brandishing of nuclear weapons, aircraft carriers, or other high-cost and technically advanced systems signal that a state is in the higher rungs of international capability. There are legitimate reasons to signal status in international politics because it sets common expectations in relations, prevents misunderstandings, incentivizes cooperation, and prevents security dilemmas by demonstrating superior capabilities. Therefore,

---


signaling status should not be automatically considered sinister but rather seen as a consistent way in which all states signal their long-term interests.

However, status can be signaled in ways that appear irrational, emotional, or dangerous to other states, a refrain heard repeatedly in U.S. and allied reactions to Russian actions.\textsuperscript{25} As the literature shows, status concerns are not irrational because of the potential stream of benefits that flows from high status. Such benefits include autonomy and deference, that is, the capacity for states not to have their decisions questioned or challenged at every turn.\textsuperscript{26}

Although most states signal their status through peaceful mechanisms, Russia often appears to also seek status through less-than-peaceful means, such as threats and harassment. There are peaceful ways of signaling status, such as conspicuous aid to other countries or demonstration of technological superiority through a space program, but coercive means are also common. Assertive actions to signal a state’s claim about the status it deserves can spread acceptance of that claim among relevant international actors.\textsuperscript{27} For example, one state’s open and easily observable demonstrations of superior military capabilities can force other states to act in ways that they would not otherwise to demonstrate deference to the signaling state.

A state can act more assertively when it perceives its status to be under threat, such as when other states admonish it for poor behavior, or it perceives that it has been denied its “rightful place” in international society.\textsuperscript{28} It can also occur when states see no opportunities for advancement in the international hierarchy or when they view the existing hierarchy as illegitimate or unstable.\textsuperscript{29} Furthermore, such behavior can be the result of

\begin{itemize}
\item \textsuperscript{27}Pu, 2019.
\item \textsuperscript{28}Wohlforth, 1998.
\end{itemize}
past instances of states giving in to threats or being taken advantage of in moments of weakness; states can overcompensate by engaging in risky or dangerous actions to regain lost status.30 States also can engage in harassing or threatening behavior to diminish a rival’s status.

Beyond simply engaging in harassing behavior or attempting to force opposing sides to back down in small-scale incidents, conflict initiation has been a viable strategy to improve status positions.31 When the result of such conflict is victory, the improvement in status can bring benefits that compensate for the costs of the conflict over a five- to ten-year period.32 However, even demonstrations of superior capabilities can force rivals to back down in disagreements when they otherwise may have persisted.33 This type of signaling is particularly important for a state that believes others do not afford it the status it deserves. Such a state is driven to signal by second-order beliefs about other states (its beliefs about others’ beliefs) and whether those states’ behavior reflects its perceived rightful status. Rightful status, of course, is an amorphous concept about the rights and privileges that other states with similar status are given, and whether the autonomy and deference given to other powers are also consistently applied to the status-concerned state.

When a state believes that its rightful status is not being recognized, it might have an incentive to engage in conflicts that it can win to achieve that recognition and the stream of benefits that go along with it into the future. In this way, status and resolve are related; enhanced status can lead to a consistent stream of future benefits for states because of increased deference from other states, just as expectations of resolve lead to states being given a wide berth so as not to challenge areas in which states have shown they will demonstrate firm resolve. Therefore, both high status and reputations for

---


Coercive Signaling

We define coercive signaling as a subset of the larger category of signaling behavior that involves military actions, short of the use of force, with coercive intent. It is the way that states send messages to one another about intent and interests when simple words could be discounted or disbelieved, when general signals of resolve cannot address the issue at hand, and when the sending of the signal is further intended to produce a specific reaction from the recipient. Coercive signaling can involve demonstrations of resolve or status-seeking, but it is specifically referring to cases of assertive actions taken to affect adversary behavior. Not all signaling entails the use of the military, and not all uses of the military are signals. However, limited military actions short of the use of force can be important signals to demonstrate a state’s commitment to an issue and determination in accomplishment of its objectives, whether it be demonstrating resolve over a specific issue or more-general shows of status.34

Schelling classifies coercive military acts as either deterrence—aimed at preventing adversary behaviors—or compellence, i.e., threatening or taking action to force the adversary to do something or to stop doing something. As Schelling notes, compellence entails “inducing his withdrawal, acquiescence or his collaboration by an action that threatens to hurt, often one that could not forcibly accomplish its aim but that, nevertheless, can hurt enough to induce compliance.”35

In this report, we define coercive signaling as Russian military actions short of the use of kinetic force that have the apparent intention of compelling, deterring, or confronting an adversary via threat. Actions must be visible enough that the threat is obvious, such as those close to another state’s territory or forces. We use the term confront here to refer to status signaling, a third category of coercive act in addition to the two identified by Schelling.

35 Schelling, 1996, p. 5.
This definition excludes kinetic uses of force because those go beyond threats. A threat can come in the form of overt actions that directly threaten or those that raise the risk of accident, collision, or escalation. Lastly, the signals must be easily observable to the target state: Large-scale military exercises on Russian territory are germane even though they might not be close to another state’s territory or forces.

Empirical Analysis of Recent Russian Behavior

Cold War Precedents

Incidents involving U.S. or North Atlantic Treaty Organization (NATO) aircraft and naval vessels and their Soviet counterparts date back to the earliest days of the Cold War. The United States was sending reconnaissance and so-called ferret missions to provoke Soviet radars off the coast of the Soviet Union as early as 1947. These missions led to incidents throughout the 1950s, many of which were far more severe than any of those that have occurred in recent years. For example, in 1952, an Air Force RB-29 conducting reconnaissance near the Southern Kurils in the Sea of Japan was downed by a Soviet fighter. None of the eight crew members were recovered. Such fatalities were not irregular occurrences in this period; in 1958, for example, 17 airmen were killed when their C-130 was downed over Soviet Armenia while collecting intelligence. Although such incidents were very rare after 1960—largely because of the advent of satellite imagery—run-ins between the sides in the air periodically continued throughout the Cold War.

The same was true on the seas. Beginning in the early 1960s, Soviet trawler-type ships that had been outfitted with intelligence collection equipment—dubbed AGIs by NATO for Auxiliary, General, Intelligence—began extremely close observation of U.S. Navy ships, submarines, and ports. The AGIs often seemed more interested in making trouble for the U.S. Navy than gathering intelligence: They frequently cut across carrier bows or refueling formations or interfered with the conduct of exercises.

---


37 Winkler, 2017, pp. 15–34.
U.S. skippers speculated that they were intent on embarrassing them by forcing a change in course or risking a collision. The AGIs were a particular problem in the waters off North Vietnam, where they attempted to disrupt carrier flight operations during the Vietnam war.\textsuperscript{38}

As the Soviet Navy deployed more-capable warships in the mid- to late 1960s, they began more assertive harassment of U.S. operations. For example, the USS \textit{Walker}, a destroyer, collided with Soviet warships twice over two days in May 1967 as it screened a carrier during anti-submarine warfare exercises in the Sea of Japan. In 1968, a TU-16 Badger was making low passes over the USS \textit{Essex} during a submarine-hunting mission off the coast of Norway when it crashed into the ocean, killing the entire crew. Several incidents occurred in waters claimed by one or the other side; before the conclusion of the United Nations Convention on the Law of the Sea (UNCLOS) in 1982, there was no agreed basis for such claims, and the United States adopted a deliberate policy of challenging Soviet claims that it did not recognize.\textsuperscript{39} Even after the conclusion of UNCLOS, divergent interpretations of its provisions led to two collisions when U.S. warships conducted freedom of navigation operations in Soviet territorial waters in the Black Sea in 1988.

\textbf{Agreements to Manage Incidents}

Many of the serious Cold War–era incidents led to diplomatic protests and demarches, but these proved to be ineffective tools absent agreed rules and procedures. Eventually, both sides determined that the risk of accidental collisions outweighed the costs of establishing limits on assertive behavior. After several rounds of negotiations, beginning in 1970, the parties signed the U.S.-Soviet Agreement on the Prevention of Incidents on and over the High Seas (INCSEA) in 1972, after which the number of incidents decreased significantly. The document calls on the two sides to refrain from aggressive actions when operating in proximity to one another. It prohibits gunpointing, low flyovers with open bomb bays, or illuminations with firecontrol radars. To facilitate communications, both sides agreed to follow

\textsuperscript{38} Winkler, 2017, pp. 35–56.

\textsuperscript{39} Winkler, 2017, pp. 57–79. Although the United States recognizes UNCLOS as customary international law, it has not ratified it.
a special set of flag signals. Moscow ended up signing 11 additional agreements with NATO member-states based on its accord with the United States. In 1989, U.S. and Soviet negotiators signed the Agreement on the Prevention of Dangerous Military Activities (PDMA), which established procedures, including banning the hazardous use of laser devices and peacetime interference with command-and-control networks by jamming. Although the PDMA has been largely dormant, it technically remains in force. These agreements did not put an end to incidents between the U.S. and Soviet or Russian militaries. But they did establish important agreed norms, drawing lines between acceptable and unacceptable behavior in military-to-military encounters. For the purposes of this report, it is important to note that violations of such agreed norms constitute a strong signal.

Post-2014 Focus
Following a long period of calm after the collapse of the Soviet Union, there has been a renewed expert focus on incidents involving Russian and NATO forces since the overall political-military relationship sharply deteriorated in 2014. Indeed, there were several headline-grabbing cases that year, including a near-accident involving a civilian airliner and a Russian fighter over the Baltic Sea. In addition to the press, several research groups, particularly the European Leadership Network (ELN) and Global Zero, have also drawn attention to these events, cataloguing what seemed like a cascade of near-misses, muscle-flexing, and bellicose military behavior. As ELN’s first of several reports on the subject put it,

These events add up to a highly disturbing picture of violations of national airspace, emergency scrambles, narrowly avoided mid-air collisions, close encounters at sea, simulated attack runs and other

---

dangerous actions happening on a regular basis over a very wide geographical area.\textsuperscript{41}

In November 2015, the first casualty emerged when the Turkish Air Force shot down a Russian Su-24 over Syria. Indeed, the persistent dangerous brinksmanship, as ELN termed it, appeared to be a prelude to a genuine clash.

As a result of this sense of urgency, essentially all of the published studies on this subject have been framed in terms of avoiding unintended conflict resulting from an accident and encouraging the relevant states either to adhere to existing rules-of-the-road agreements or to negotiate new ones.\textsuperscript{42} Indeed, some of the incidents documented did seem to run afoul of existing agreements, such as INCSEA. Moreover, there was certainly the need to negotiate new norms for specific circumstances. For example, the combination of increased Russian Air Force activity in recent years and Moscow’s loss of land-based access for military resupply purposes to the Kaliningrad exclave, which is home to the Baltic Fleet and several other military facilities, created particular circumstances in the Baltic Sea area. To supply its outposts in Kaliningrad and transport materiel there, the Russian military now regularly flies transport flights to the exclave from St. Petersburg. As Figure 2.1 demonstrates, most of the Baltic Sea falls within the territorial waters of a littoral state and thus its airspace. Flying from one part of Russia to another thus compels the Russian Air Force to approach, if not breach, the airspace of a littoral state. This flight path, which became known as the St. Petersburg–Kaliningrad Milk Run, is responsible for many of the incidents in the region. Moreover, civilian pilots had grown unaccustomed to military flights in the region following the dip in activity in the 1990s and were unaware of agreed procedures.\textsuperscript{43}


\textsuperscript{43} Authors’ interview with NATO official, June 2020.
Following negotiations that began under the aegis of the Baltic Sea Project Team, a group of civilian air traffic control experts facilitated by the International Civil Aviation Organization (ICAO) and European Organisation for the Safety of Air Navigation (EUROCONTROL) and including representatives from Russia, agreements were reached on several issues that significantly reduced the incident numbers in the region. As part of
Defining Coercive Signaling and Identifying Possible Drivers

these arrangements, Moscow agreed to provide EUROCONTROL flight plans for military cargo flights going between St. Petersburg and Kaliningrad. Russia, Finland, and Estonia also agreed on a new flight path between St. Petersburg and Kaliningrad to avoid inadvertent airspace violations in the Gulf of Finland. While the overall numbers of incidents has dropped significantly, the narrow corridor for the milk run from St. Petersburg to Kaliningrad still brings Russian military aircraft close to NATO airspace on a regular basis. NATO’s Baltic Air Policing mission regularly scrambles fighters to intercept these Russian flights, particularly if no flight plan has been filed, radio contact is not maintained, or there is no active transponder on board.44 Although the Russian flights are seen as more assertive when one or more of these actions have not been taken, Moscow is not obliged to do any of them by international regulation. Even when none of the three steps are taken, the intercepts themselves are routine, uneventful activities. They happen frequently because of geographical proximity (see Figure 2.1).

The skies over Syria were another area that required a new agreement to avoid incidents. Following Russia’s September 2015 intervention in the civil war there, U.S. and Russian air forces were operating in the same airspace without coordination or communication. To avoid an unintended clash, the two sides signed a memorandum of understanding the following month that established what came to be known as the deconfliction mechanism: agreed safety protocols for aircrews, specified communication frequencies for pilots, and the establishment of a hotline between the regional commanders.45

Analyzing Russian behavior through the lens of risk reduction, however, is prone to bias; it starts with a policy solution in mind and works backward to the problem. This report puts the problem—Russia’s activities and the resulting incidents—at the center of the analysis and only draws out recommendations using the empirically grounded conclusions about Moscow’s motives. Negotiated agreements might or might not be the solution. As of

44 NATO Allied Air Command, “We Secure the Skies,” webpage, undated.
this writing, this is the only published report that analyzes these incidents by trying to understand Russia’s objectives.

Differentiating Among Incidents

Press and even specialist accounts of coercive signaling incidents tend to conflate incidents that differ quite dramatically in terms of their significance for U.S. national security and potential underlying Russian motives. For example, one *New York Times* article in September 2020 described “six Russian warplanes flying close enough to Alaska that Air Force F-22s scrambled to intercept them” in the same paragraph as another incident when “Russian fighter jets repeatedly veered 100 feet in front of a U.S. Air Force B-52 bomber over the Black Sea.” Despite the urgency implied by the terms “intercept” and “scramble,” the act of sending up U.S. fighter jets to visually identify Russian bombers that have entered the Air Defense Identification Zone (ADIZ) off Alaska is routine. Russian bombers have conducted periodic training flights off Alaska since 2007., when these flights resumed after a 15-year post–Cold War hiatus. At no point during these intercepts are any of the aircraft involved in any danger. The Russian LRA have never violated U.S. airspace; an ADIZ is a unilaterally declared norm not recognized by international law. By contrast, during the incident over the Black Sea, as described in greater detail in Chapter Five, the Russian pilots violated agreed INCSEA norms and did create a dangerous situation for the U.S. B-52. It was anything but routine. According to U.S. officials, such dangerous incidents are a tiny fraction of the overall number of air- and sea-based interactions between Russian and U.S. forces.

Analysis of these incidents using information from published sources faces significant constraints that further complicate the task of differentiating among cases. In fact, it is likely that the true denominator—the overall number of interactions—is unknown to anyone because there is no obligation for reporting incidents that are not unsafe or otherwise problematic. In


48 Authors’ interview with U.S. Department of Defense official, July 2020.
the case of U.S. Navy vessels’ interactions with other states’ ships that do not reach the level of INCSEA violations, U.S. ship captains have the prerogative as to whether to report these interactions.\textsuperscript{49} For open-source analysis, we must rely on the decision of one of the parties involved in an incident to publicize it. It is possible that both parties might decide not to make an incident public, in which case there would be no publicly available information about it. Among NATO governments, and even within those governments, the threshold for issuing a press release regarding an incident varies depending on the particular entity involved and the preferences of its leadership. In some cases, multiple entities are party to the same incident. For example, the host country (one of the Baltic states), the country whose pilots are flying the airframe, or NATO Air Command can independently decide whether a Baltic Air Policing intercept is made public.\textsuperscript{50} In short, any analysis of these events cannot, by definition, be based on a complete picture. That said, there are enough data available in the public domain to conduct such an analysis.

**Parsing Russia’s Possible Objectives: Hypotheses**

The literature review and brief overview of the history of incidents involving Russia suggest a variety of possible drivers of Moscow’s behavior. Here, we posit several hypotheses regarding Russian motives for the purpose of further analysis in later chapters. We start with incidents that qualify as coercive signaling, i.e., they are a means of compelling, deterring, or confronting an adversary via visible threat. Each of these three can be seen as the objective of the Russian action. We begin with compellence.

\textsuperscript{49} Authors’ interview with U.S. Department of Defense official, July 2020.

\textsuperscript{50} Authors’ interviews with U.S. Department of Defense and NATO officials, June and July 2020.
Hypothesis 1: Russia Seeks to Compel a Change in Ongoing U.S. or Allied Behavior

Actions consistent with this hypothesis would have to be taken in response to a U.S. or allied activity. However, beyond that, compellence could come in multiple forms. As we have seen in some of the Cold War-era incidents, at times the Soviet military sought to prevent a particular ship or plane from executing its mission. This more-tactical act of compellence we refer to as H1a.

H1a: Tactical Compellence: Compel a Change to an Ongoing Military Action

In all likelihood, brinksmanship would be necessary feature of actions consistent with H1a because risky moves generally are required to compel an adversary’s military to do something it was not planning on doing. Furthermore, we should be able to identify a tactical military objective driving Moscow’s behavior, such as forcing a U.S. reconnaissance flight away from Russia’s shores. To qualify as tactical compellence, we must be able to pinpoint such a plausible change in the particular ongoing adversary ship’s or plane’s behavior that Moscow expects to result from its action. But not all acts of compellence concern this tactical level. Therefore, we consider broader compellent goals as a separate hypothesis, H1b.

H1b: Operational Compellence: Compel a Change in a Pattern of Behavior, Usually to Dissuade Further Action

H1b points to incidents in which Russian behavior is likely not aimed at altering the ongoing U.S. or allied action but instead is intended to affect future decisions to take such an action. Like H1a, there has to be an antecedent U.S. action to which Russia is responding. But unlike H1a, operational compellence implies that the Russian action could not plausibly force a change in the ongoing activity. Instead, H1b covers actions that raise the risks and costs associated with a given activity and thus plausibly could make the adversary think twice about conducting that activity again. Low aerial passes over a surface ship in a sensitive area, for example, cannot prevent that ship from operating or conducting maneuvers, but such behavior could convince the navy involved that it is not worth the trouble to return to
that area. Some might use the term *deterrence* to refer to H1b-type actions; as in, Russia wants to deter future behavior similar to the action to which it is responding. However, deterrence has failed because the action in question has already been taken. Therefore, compellence is a more appropriate term.

H1a and H1b do overlap. It is reasonable to assume that any action taken to interrupt an ongoing activity (H1a) is likely also intended to dissuade such future activities (H1b). However, not all actions taken to dissuade repetition of an ongoing activity (H1b) are capable of, or intended to, block that ongoing activity.

Another variation of compellence relates to Schelling’s concept of coercive bargaining.

**H1c: Coercive Diplomacy: Force a Negotiation Related to the Ongoing Activity**

If Russia’s assertive actions in a particular region and/or domain coincide with an offer to negotiate a norm regarding activities in that region and/or domain, Moscow could be using coercive signaling to force such a negotiation to begin or improve its own bargaining position. For Russian strategists, acts of armed compellence as parts of a broader coercive bargaining process to achieve a political objective are not new. For example, the 1999 *dash to Pristina*—when 200 Russian troops entered Kosovo without warning and took up positions at the Pristina airport as senior officials were negotiating—was used by Moscow to secure a more significant role in the subsequent peacekeeping operation. A high-ranking General Staff officer described the move in Schelling-esque terms: “The actions of the battalion created conditions for more constructive negotiations. . . . After the dash, the situation at the talks became simpler.”

Our U.S. and NATO interviewees also suggested that Moscow uses incidents of recent years to push for negotiations. Andrew Weiss and Nicole Ng have made the same case regarding Russian signaling efforts in Syria:

---


52 Authors’ interviews with NATO and U.S. Department of Defense officials, June and July 2020.
Risky Russian maneuvers were frequently tied to narrow goals, such as forcing U.S. counterparts to hold a conversation on one of the deconfliction hotlines, schedule a face-to-face meeting, or adjust a deconfliction agreement in Russia’s favor.53

In the case of coercive signaling, if this hypothesis is accurate, diplomatic offers should coincide with an uptick in incidents and particularly assertive incidents in the same domain and geography of Russia’s proposal (e.g., more intercepts of bombers over the Black Sea occur before a diplomatic proposal regarding air activity in the Black Sea region). Therefore, this hypothesis is most applicable to explaining patterns of behavior rather than specific incidents.

We include classic deterrence signaling in our second hypothesis.

H2: Deter Possible Adversary Aggression

For H2, we are strictly using deterrence to refer to adversary actions that have not occurred yet. In this case, Russian actions would not be responding to immediate precipitating U.S. actions; Moscow’s objective is to dissuade the United States from doing something that it has yet to do (e.g., attack Russia). Activities consistent with H2 therefore occur according to Russia’s schedule and plans. Furthermore, by its nature, deterrence signaling will be addressed to the national leadership of the adversary, not a particular local commander. Messaging the consequences of aggression to a particular pilot, for example, seems a less plausible means of conveying a deterrent message than highly visible capability demonstrations that will receive broad attention. Because H2-type deterrence activities are not taken in response to particular U.S. or allied behaviors, the domain and geography in which they take place do not distinguish them.

We capture the status signaling phenomenon in our third hypothesis.

53 Weiss and Ng, 2019.
H3: Status Signaling: Force an Adversary to Acknowledge Russia’s Status

There is a broad consensus among scholars of Russian foreign policy that Moscow seeks acknowledgment of its great power status, particularly from the United States.\textsuperscript{54} The Kremlin has tended to take umbrage when Washington does not demonstrate the respect that Moscow believes it deserves. Some U.S. military leaders have explained Russian assertive military behavior in these terms. For example, Gen (ret.) Frank Gorenc, the former commander of U.S. Air Forces in Europe, commented on assertive behavior by noting that the Russian military “feels as if it’s necessary to let everybody know that they’re still on the world stage, that they’re still on the scene, and that they have pretty good military power . . . Declining powers have to do [something].”\textsuperscript{55} Officials who were interviewed for this report suggested that some in NATO governments tend to look for links between incidents with Russia and concurrent political or diplomatic events, and that Moscow is using coercive signaling to express umbrage at these events.\textsuperscript{56}

Activities covered by this hypothesis are those aimed at coercively signaling that Russia is unsatisfied with U.S. or allied policies and approaches toward Russia. To be consistent with this hypothesis, a coercive signaling incident would not be aimed at affecting a particular adversary behavior but instead at demonstrating Moscow’s discontent with the broader status quo. Indeed, unlike all activities that fall under H1, activities consistent with H3 should have no identifiable military or political-military objective. In other words, status signaling is meant to change an adversary’s broader policies and attitudes rather than a particular ongoing activity. As a result, unlike H1-type compellence activities, activities consistent with H3-like status signaling could take place far from Russia’s homeland or sphere of influence;


\textsuperscript{56} Authors’ interviews.
because the message is a diffuse one not directly connected with immediate threats to Russian national security, it is possible to deliver it anywhere. Therefore, it is unlikely that Russia would engage in brinksmanship merely to show its pique in this way. Although H3 status signaling would not be applicable when Russia is responding directly to U.S. activities, H3 would apply to tit-for-tat episodes; for example, when Moscow engages in coercive signaling as a reaction, perhaps long after the fact, to an action that showed a lack of U.S. acknowledgment of Russia's perceived status.

We also consider the possibility that the activities under consideration here are not, in fact, examples of coercive signaling. We posit four alternative hypotheses, derived from both the policy discourse and the academic literature, to explain them. The first such hypothesis is AH1.

AH1: Russian Pilots or Captains Are Acting Unprofessionally or Making Decisions Without Authorization

AH1 suggests that such incidents and close calls are not a function of a Russian policy of coercive signaling, but instead the result of the decisions of individual pilots or ship captains. This explanation has been put forth by U.S. and allied officials regarding particularly spectacular run-ins with Russian ships or planes. In some cases, they allege that the Russian operator in the interaction behaved “unprofessionally” by transgressing an agreed norm, code of conduct, or widely understood safety practices. For example, a senior U.S. commander commenting on an incident in April 2020 said, “My conclusion at this point is that it was probably something more along the lines of unprofessional as opposed to deliberate.”\(^57\) Such unprofessional behavior could result from poor training or lack of familiarity with agreed procedures. A variation on AH1 is that the incidents do not result inadvertently from the mistakes of Russian operators but instead are deliberately engineered by them without authorization from their superior officers. If this were true, the action in question could not by definition be a signal. Because we do not have access to the internal workings of the Russian chain of command, it is very difficult to prove this hypothesis using first-hand evi-

\(^{57}\) Cited in Pawlyk, 2020.
evidence. Moreover, officials have an incentive to publicly disavow knowledge and/or authorization of incidents, even when the behavior was in fact authorized. Putin, for example, publicly denied that he had authorized or even knew in advance about an incident involving a U.S. destroyer in the Black Sea in 2014.\textsuperscript{58} However, similar incidents occurred after his statement, suggesting that it was disingenuous. Moreover, we can identify a plausible military objective for that incident (see Chapter Five); if an objective is apparent, operator error or unauthorized behavior is a less likely explanation. We can also find proof for AH1 through large-\textit{N} studies of incidents if we find no patterns in the data. If the behavior seems random, it is more likely to be a function of individuals’ decisions rather than official policy.

Other explanations connect the increased number of incidents with the trajectory of Russia’s capabilities in recent years. Because there were essentially zero incidents in the 1990s, when the Russian military was at its nadir, it seems clear that there is some degree of correlation between capabilities and incidents. The Russian military has to have the capacity and wherewithal to conduct the operations in question. For much of the 1990s and early 2000s, when the post-Soviet economic contraction was most severe and the Russian military had a bloated, legacy structure, it mostly did not. For example, the Russian LRA did not conduct regular out-of-area training flights from 1992 until 2007. The second alternate hypothesis goes further and explains any increase in either overall incident numbers or assertive incidents as a function of Moscow’s capabilities.

\textbf{AH2: Any Increase in Russian Incidents Is Largely a Function of the Revival in Russia’s Military Capabilities}

This hypothesis can only be assessed through a large-\textit{N} analysis. Evidence in favor of it would be a correlation between increases in incident numbers and improvements in Russian military capacity and no evidence of correlation with other factors, such as U.S. activities. If the patterns in incident numbers do correlate with other factors, that would suggest that this hypothesis is not an accurate representation of the drivers of Russian activity.

It is also possible that Russian behavior is driven by domestic political factors. Specifically, some have argued that the Kremlin uses tensions with the West to bolster its approval ratings. For example, Michael McFaul and Kathryn Stoner have written that, “To maintain his argument for legitimacy at home, Putin needs perpetual conflict with external enemies.” Particulary after Russia’s economic growth slowed in the early 2010s, the Kremlin drew up a new social contract that was based on protecting the Russian people from external threats. Leon Aron has cautioned that dips in Putin’s popularity might spark external aggression. By this logic, the Russian leadership could be deliberately creating the impression of a warlike environment through these incidents to shore up its popular support.

**AH3: These Incidents Are Artificial Attempts to Stoke Tensions with the West to Create a Rally-Around-the-Flag Effect and Bolster Putin’s Ratings**

Evidence to assess the validity of AH3 would also have to come through large-\(N\) analysis because it is difficult to demonstrate relevant causality for a single incident. If AH3 were true, we would expect to see spikes in the number of incidents and, particularly, assertive incidents slightly after a dip in Putin’s popularity. The proposition is that the Kremlin responds to a downward trajectory in approval ratings by precipitating more incidents.

Finally, we know for certain that states engage in activities similar to coercive signaling to provoke a response from the adversary for the purposes of gathering valuable intelligence about capabilities, concepts of operations (CONOPs), or readiness. Indeed, the first U.S.-Soviet aerial incidents were a function of the so-called ferret missions along the Soviet periphery, when American pilots got close enough to flush out the precise location and capabilities of electronic and radar defenses. As one pilot recalled, “We’d fly in at low level below radar and then pop up in their airspace . . . Our flights

---


were intentionally very provocative.” It is plausible that Russia is doing the same today.

AH4: Russia Is Seeking to Provoke a U.S. Military Response to Gather Better Intelligence on U.S. Capabilities, Concepts of Operations, or Readiness

Incidents consistent with this hypothesis would be initiated by a Russian action, not a U.S. or allied action. For example, a Russian intercept of a U.S. flight would not be consistent with AH4. We should also be able to identify a U.S. military response that the Russian action was intended to provoke.

The hypotheses and alternative hypotheses are summarized in Table 2.1.

---

**TABLE 2.1 Hypotheses Summary**

<table>
<thead>
<tr>
<th>Hypothesis</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>H1a</td>
<td>Tactical compellence: Compel a change to ongoing military action.</td>
</tr>
<tr>
<td>H1b</td>
<td>Operational compellence: Compel a change in a pattern of behavior, usually to dissuade further action.</td>
</tr>
<tr>
<td>H1c</td>
<td>Coercive diplomacy: Force a negotiation related to the ongoing activity.</td>
</tr>
<tr>
<td>H2</td>
<td>Deter possible adversary aggression.</td>
</tr>
<tr>
<td>H3</td>
<td>Status signaling: Force an adversary to acknowledge Russia’s status.</td>
</tr>
<tr>
<td>AH1</td>
<td>Russian pilots or captains are acting unprofessionally or making decisions without authorization.</td>
</tr>
<tr>
<td>AH2</td>
<td>Any increase in Russian incidents is purely a function of the revival in Russia’s military capabilities.</td>
</tr>
<tr>
<td>AH3</td>
<td>These incidents are artificial attempts to stoke tensions with the West to create a rally-around-the-flag effect and bolster Putin’s ratings.</td>
</tr>
<tr>
<td>AH4</td>
<td>Russia is seeking to provoke a U.S. military response to gather better intelligence on U.S. capabilities, CONOPs, or readiness.</td>
</tr>
</tbody>
</table>

---

Evaluating the Hypotheses

To test the aforementioned hypotheses about the drivers of Russian behavior, we used three different methods. In Chapter Three, we analyze relevant concepts from Russian strategic writings. We do so to understand how Russian decisionmakers and military leaders discuss issues related to coercive signaling. We seek to identify elements of Russian strategy that are—or are not—consistent with the hypotheses that were described in the previous section. Such an analysis cannot be definitive because Russian strategists might not discuss relevant elements of doctrine or practice openly. But our analysis can suggest which of the hypotheses and implied objectives are consistent with how Russian leaders themselves conceive of the purpose of these operations. In Chapter Four, we provide a large-\(N\) statistical analysis of possible Russian coercive signaling incidents from 2010 through 2018. As discussed in detail in that chapter, some of the hypotheses are more conducive to statistical analysis than others. Finally, in Chapter Five, we examine cases of Russian coercive signaling in greater detail and assess the extent to which the hypotheses can explain the outcomes observed. It should be noted that we are not conducting a strict positivistic hypothesis testing approach in this report. Of our three evaluation methods, none are appropriate for evaluating all of the hypotheses. Therefore, none can definitively validate or refute the hypotheses; they can, however, provide evidence that supports or does not support a given hypothesis. Moreover, not all of the hypotheses are applicable to all coercive signaling incidents. It is not plausible, for example, that a major strategic exercise could have been the result of an unauthorized action. Equally, it is not plausible that a Russian intercept of a U.S. flight could be a case of classical deterrence because the U.S. action has already occurred.
CHAPTER THREE

Russian Strategic Thinking on Signaling

Introduction

Russian strategy does not offer a comprehensive theory or consolidated explanation of how and why Moscow uses its military to send signals. Moreover, there is no term in Russian for signaling in the sense that it is used in Western scholarship and policy discussions. However, there are several relevant concepts in Russian strategy and military science that cover elements of coercive signaling as defined in this report. Understanding these concepts can provide insight into why Moscow might use coercive signaling to achieve its objectives. These concepts range from strategic, whole-of-government precepts like sderzhivanie (best translated in this context as causing the adversary to act with restraint) and sderzhivayushchie deistviya (actions taken to that end) down to operational and tactical military concepts, such as demonstratsonnye deistviya (demonstrational actions) and prinuzhdenie (often translated as coercion, but its meaning in this context is closer to compellence). A close read of these concepts in Russian military journals and their colloquial use by Russian commanders and senior officials demonstrate that Moscow does conceive of its actions in ways that are consistent with several of the hypotheses offered in Chapter Two. We also consider how Russian officials have reacted to and interpreted U.S. signaling activities. Moscow could be engaging in mirror imagining—that is, projecting its own motives onto similar adversary actions—so its interpretations of these events could provide insight into its own thinking about signaling.

This analysis can help validate our coercive signaling hypotheses (H1a, H1b, H1c, H2, and H3) by revealing whether the Russian military and polit-
Identification of evidence in strategy for one of the hypotheses cannot, however, falsify it. There are a variety of plausible reasons why, for example, compellence concepts could exist but not be discussed openly. Furthermore, the strategy evidence does speak directly to the validity of the alternative hypotheses. We would not expect to find evidence that Russian military or other leaders explain the incidents by pointing to their officers’ authorized or unprofessional behavior (AH1), the increase in Russian capabilities (AH2), or Putin’s approval rating (AH3). The most likely of the four to be found in the strategic literature—AH4, provoking adversary responses—is also absent.

Relevant Russian Concepts

Sderzhivanie or Strategic Sderzhivanie

Often translated as deterrence, the Russian word sderzhivanie has a much broader meaning.¹ Deterrence, from the Latin terrere, is about instilling the fear of the consequences of aggression in the mind of an adversary. The Russian word sderzhivanie, by contrast, comes from the root derzhat’—to hold—with a prefix to give it the meaning “hold back”—sderzhivat’. Common translations are to restrain, keep back, hold in check, or contain. Sderzhivanie is thus concerned with actions taken to hold an adversary back, not necessarily to affect its state of mind to achieve the same objective. Causing restraint also does not only apply to actions taken before conflict initiation to prevent conflict. Sderzhivanie thus does not entail an exclusive focus on the prevention of adversary aggression as deterrence does. In recent years, the concept of strategicheskoe (strategic) sderzhivanie has become central to Russian thinking about the country’s defense strategy. As Russia’s 2015

National Security Strategy declares, the “achievement of the strategic goals of defense of the country” is carried out through strategic **sderzhivanie**.\(^2\)

According to the official Defense Ministry definition, strategic **sderzhivanie** refers to “a system of coercive and non-coercive measures carried out on a consistent basis by one state to restrain another state from any possible coercive actions.” Strategic **sderzhivanie** is meant to be “carried out continuously, in both peacetime and war, and not only for preventing coercive actions, but also for keeping the target state within certain limits.” Strategic **sderzhivanie** is intended to influence routine, peacetime interactions with an adversary.\(^3\)

The Defense Ministry’s definition specifies a variety of measures that the state uses to carry out strategic **sderzhivanie**. The list includes a number of activities that would qualify as signaling: “demonstration of military presence and capabilities . . . actions [to defend] national airspace, land borders, and maritime boundaries; military presence; demonstrational mobilization of forces to a wartime footing (bringing forces up to full readiness); a significant buildup (deployment) of groups of forces; demonstrational preparation of specified forces and capabilities (including nuclear capabilities) to conduct strikes.” The definition further states that “in peacetime, strategic **sderzhivanie** is carried out in order to preempt threats and prevent aggression, while in wartime, it is for the prevention (denial, ending) of escalation (or in the interest of de-escalation) of a military conflict or for ending a conflict early on advantageous terms.”\(^4\) According to this concept, then, Moscow takes numerous assertive (“coercive”) actions under the banner of strategic **sderzhivanie** to compel an adversary to change its behavior and deter it from possible aggression. Using those Western terms, the objective of “causing restraint” is carried out as compellence if the adversary is already acting

---


without restraint and deterrence if the adversary has yet to do so. In Russian strategic thinking, that distinction is irrelevant.

By justifying a range of activities to force the adversary to be more restrained, strategic sderzhivanie constitutes a broad conceptual basis for coercive signaling activities. Russian strategy implies that when Moscow believes an adversary is behaving in a way that poses threats to Russian interests, it will take action to induce restraint. Sderzhivanie thus provides evidence supporting H1b (compelling a change to an ongoing pattern of behavior) and H2 (deterrence).

Sderzhivayushchie Deistviya

Russian military science uses the term sderzhivayushchie deistviya—the present active participle form of sderzhivat’ and the word for actions—to refer to steps the military takes to implement strategic sderzhivanie. As two military scholars write, “The sderzhivayushchie deistviya of the Russian armed forces is the core mechanism for strategic sderzhivanie.”5 The Strategic Rocket Forces official encyclopedia provides a bit more detail about these actions, as seen through that service’s lens:

Demonstrational actions [such as] demonstrating to the adversary changes in the readiness state of the force . . . The specific quality of sderzhivayushchie deistviya is that they are conducted deliberately overtly . . . activities to carry them out can be announced in advance to the adversary.6

Unsurprisingly, the nuclear-focused component of the Russian armed forces mostly construes sderzhivanie as deterrence (H2).

Demonstrational Actions

Demonstrational actions (демонстрационные действия) are actions intended to signal military readiness and resolve. Russia’s military encyclopedia offers the following definition:

A purposeful open [transparent] display of a state’s military power to a possible or emerging adversary, confirming the readiness and determination of the country’s leadership to use available military force to protect the vital interests of the state and ensure strategic sderzhivanie. They are carried out in peacetime and wartime.7

According to the encyclopedia, the Russian military will signal its readiness and resolve through demonstrational actions in the following ways: (1) increasing military readiness to an appropriate level and maintaining that readiness in general, (2) holding exercises and other events to demonstrate high combat capabilities of its forces, (3) revealing or testing new weapons or missile launchers, or (4) maintaining a forward military presence near the land and maritime borders of the Russian Federation.8

Not every case of the behaviors on this list are necessarily demonstrational actions. Much of Russian military behavior—even that which occurs in international airspace or oceans—is designed to fulfill predetermined readiness requirements. For example, annual pilot flight hour requirements across the force or quotidian readiness standards at the unit level are set by the General Staff. It is important to note that these readiness standards to 2020 and beyond were established over a decade prior, at the beginning of Russia’s defense reform program, and well before tensions flared with NATO in 2014. In other words, not every exercise or readiness check is a demonstrational action.

---


8 Ministry of Defense of the Russian Federation, undated-a. Within this concept there are two parties: the demonstrator, or a country or group of countries seeking to achieve certain political goals by holding demonstration events, and the spectator—a country or group of countries to which military power is being demonstrated.
Writing in the late 1990s, a senior General Staff officer expounded on the concept of demonstrational actions. He explained that they are a means of deterrence and thus war avoidance:

The perception of a country’s military power needs to be constantly maintained in peacetime. Neglecting the demonstration of military force is dangerous and can lead to the appearance of an illusion of impunity for a potential aggressor, i.e., in fact, provoke it. To convince the enemy of the opposite in the course of a military conflict is much more expensive than demonstrating military force in peacetime. Therefore, it is necessary to demonstrate military force within reasonable limits; to a certain extent it serves to prevent war.9

The demonstrational action is conceived of mostly in terms of deterrent threats, but as with sderzhivanie, there is not a clear distinction made between compellence and deterrence. Demonstrational actions thus are consistent with operational compellence (H1b) and deterrence (H2).

The same Russian military author also links demonstrational actions directly to diplomacy. He writes, “[Such actions are] on the line between diplomatic and armed confrontation . . . on the one hand, demonstration of military force is a form of employment of the armed forces, but on the other hand, it is a continuation of the diplomatic efforts of the state, since the military is being employed without armed violence.”10 In other words, we see that demonstrational actions are also consistent with H1c, compellence combined with a diplomatic campaign.

**Prinuzhdenie**

The final relevant concept is *prinuzhdenie*. Often translated as “coercion,” *prinuzhdenie* in this context is closer to the version of tactical compellence conveyed in H1a. This term is most often used by military commanders to describe using military power to force an immediate change in adversary behavior. For example, when used to describe Russian Air Force training, the term is often used to describe “forcing an enemy aircraft to land”

---

or “intercept[ing] and compel[ling] enemy aircraft] to land.” Russian Air Force units practice this skill using a notional opposing force aircraft as part of their standard readiness qualifications. The Russian Navy uses the term *prinuzhdenie* to describe stopping an enemy ship from breaching the maritime boundary of the Russian Federation or forcing an enemy submarine to surface; the fleets practice these skills during their annual training cycles.

It is interesting to note that Russia appears to have recently modified its rules of engagement during these sorts of encounters. Russian aircrews now have the authority to fire weapons on an aircraft, helicopter, or unmanned aerial vehicle that has violated Russian borders, refused to leave or respond to signals, and has no passengers aboard.

### Russian Views on U.S. Signaling Activities

Russian civilian and military officials have publicly conveyed their interpretations of recent U.S. military signaling activities. We reviewed many of these statements and other materials to determine whether they provide insights into how Russia conceptualizes signaling more broadly. We evaluated remarks from senior officials’ speeches, military science journals, and

---


military press briefings. Although Moscow certainly uses public statements to shape opinions as well as convey its own, we nevertheless found useful insights that provide additional context to Russian thinking on military signaling.

Russian officials describe their own forces as acting professionally and appropriately in response to needlessly provocative or hostile U.S. or NATO signaling activities. In 2020, Chief of the General Staff Valery Gerasimov noted that Russian “military pilots and commanders of naval ships are behaving with restraint and in accordance with applicable international legal documents.”14 He and others point to the variety of U.S. military activities taking place near Russian borders as proof of Washington’s irresponsible behavior. Russian officials refer to certain types of activities, such as U.S. flights or freedom-of-navigation operations near Russia, as “hostile and provocative” and deem NATO military exercises to have an “anti-Russian” focus.15 Russian officials and military analysts have referred to U.S. and NATO behavior as potentially destabilizing, unsafe, or both.16

Russian officials also have noted quantitative increases of U.S. and NATO military signaling activity that they believe is targeted against Russia. They claim that the increase in overall volume of U.S. and NATO events in recent years suggests that “the U.S. and its allies continue to destroy the existing security system in Europe.”17 For example, they frequently cite increases of NATO reconnaissance flights near Russia, most recently noting a 30 percent increase from 2019 to 2020, according to Russian Defense Minister Sergei

---


16 One Russian writer has noted that U.S. bombers near Kamchatka and the Sea of Okhotsk performed a mission without transponders and did not respond to Russian civil ground traffic controllers (Vladimir Shcherbakov, “Dinamichnyi ‘kharassment’: Amerikanske strategicheskie bobarivovshchiki proveryayut na praktike novuyu kontseptsiyu pentagona,” Aerokosmicheskoe obozrenie, No. 3, 2020).

Shoigu.¹⁸ Russian defense officials note that NATO exercises are becoming larger: Black Sea exercises have increased by 33 percent from 2019 to 2020 and now involve fighter aircraft, bombers, and simulated missile strikes, where in the past, they involved mostly reconnaissance aircraft.¹⁹ A Russian military analyst even attempted to estimate the financial costs for the United States to maintain this level of activity (dollars per flight hour for heavy bombers) and used these costs as a proxy for the strategic value that the United States places on intimidating Russia, even during the coronavirus pandemic.²⁰ Russian officials have also publicly questioned why these types of activities did not decrease in 2020 during the pandemic.²¹

In addition to general condemnations of U.S. and allied activities, Russian analysts have made one specific allegation: that the U.S. military uses bomber flights near Russia’s borders to rehearse an attack. One notes that since the implementation of the U.S. dynamic force employment (DFE) concept in 2018, which he calls dynamic harassment, U.S. bomber flights have become unpredictable, patrol in sensitive areas for Russia, and occasionally are armed with long-range anti-ship missiles, all of which show U.S. intent to “rehearse strikes on Russia in new areas” or familiarize its bomber crews “with a future theater of military operations” near Russia.²² Prior to DFE’s adoption, he claims that U.S. strategic bombers flew fairly predictable missions and routes, which was important for stability: The training purposes of the flights were generally understood by Russian planners. In short, the recent pattern of bomber activities is portrayed as crossing a line from training to more-threatening rehearsal of aggression.


²⁰ His estimates are $70,000 per flight hour for a B-1 bomber and $150,000 per flight hour for a B-2A bomber (S. Yakukhno, “Perspektivy razvitiya strategicheskoi bobardirovochnoi aviatsii VVS SShA,” Zarubezhnoe voennoe obozrenie, No. 6, 2020).


The then-commander of the Russian Aerospace Forces, Colonel General Sergei Surovikin, shared his assessment that the August 2020 Allied Sky NATO exercise simulated a cruise missile strike on Russia. In his telling, a four-ship B-52 bomber task force simulated strikes against targets deep inside Russia from the Black Sea and over Estonia, while at the same time another B-52 pair conducted similar training missions over the Arctic.\textsuperscript{23} The language that Surovikin used in this assessment evokes a prominent concept in Russian threat perceptions and military strategy: a massed aerospace attack from multiple strategic directions.\textsuperscript{24} Surovikin went on to connect weeks of subsequent U.S. bomber flights in Europe as a related training event, claiming that Russian “objects located on the territory of the Southern Military District were considered as targets.”\textsuperscript{25} In another recent example, the General Staff conveyed its dismay over the first U.S. surface action group deployment to the Barents Sea since the 1980s by providing a detailed public briefing of its reconnaissance and analysis of this event. They claimed that while in the Barents Sea, the U.S. ships practiced striking Russian targets and intercepting Russian ballistic missiles. That the United States provided advance warning of this deployment and deliberately left the area before the 75th anniversary of Victory in Europe Day out of respect for its significance to Russia offered little comfort to the General Staff: “We regard such actions as provocative in spite of the fact that the American side notified [us] about the arrival of these ships into the Barents Sea.”\textsuperscript{26}

Two themes emerge from this analysis. First, when it comes to military signaling, Russia views the United States as a provocateur and portrays itself as the responsible and pragmatic power—and as the underdog. Of course, this portrayal is mostly posturing and an attempt to shape public opinion. But the degree of “othering” of the United States in this context suggests that this portrayal is not mirror imaging: The narrative is that Russian behavior


\textsuperscript{25} Ministry of Defense of the Russian Federation, 2020c.

\textsuperscript{26} Ministry of Defense of the Russian Federation, 2020b.
is dramatically different from U.S. behavior, so Moscow might not assign its motives to Washington’s actions. Second, the characterization of recent U.S. activities suggests that Moscow sees a distinction between different types of signaling activities. The statements indicate that H2-type deterrence signaling is expected to follow regular, predictable patterns to reinforce messaging about the consequences of aggression. When such activities occur in new, sensitive areas, follow new flight paths, break past patterns, or suggest novel strike packages, they are no longer seen as steady-state deterrent messages but instead belie more-hostile intentions. Indeed, Russia’s core strategic deterrence signaling activity, LRA flights, is generally highly predictable and consistent. By extension, then, Russia sees its H1-type compellence activities as defensive and reactive.

Conclusion

This brief examination of Russian strategy relevant to coercive signaling demonstrates that there is strategic thinking plausibly driving Moscow’s behavior. Russian military strategists have developed an all-encompassing concept of strategic sderzhivanie that rationalizes a variety of actions to coerce an adversary to demonstrate restraint. That coercion can come in the forms of H1b-like compellence and H2-type deterrence. The operational concepts of sderzhivayushchie deistviya and demonstratsionnye deistviya indicate that the military thinks in the terms of H1b and H2 objectives and links compellence with diplomatic processes consistent with H1c. The tactical use of the term prinuzhdenie suggests that standing instructions to use coercive signaling as a means of compelling an adversary’s military forces to change an ongoing behavior do exist (H1a) and can be carried out when circumstances demand. Russian portrayals of U.S. activities suggest that Moscow expects H2-type deterrence signaling to follow regular, predictable patterns. We did not find evidence that Russian military strategists think in the terms of status signaling (H3).
CHAPTER FOUR

Statistical Analysis of Russian Coercive Signaling

Introduction

Drawing conclusions about Russia’s objectives in its coercive signaling using only close study of specific incidents could lead to false inferences about broader patterns of behavior. A statistical analysis of a large number of activities can offer such generalizations and help us better understand the drivers of Russian behavior on a macro scale. A large-\(N\) quantitative approach allows us to make inferences using broad patterns over of Russian actions over time.

In this chapter, we describe the data set we created on possible Russian coercive signaling incidents between 2010 and 2018 and the coding effort we undertook to classify these incidents. We also describe the original data sets of relevant U.S. (blue) and allied (green) activities that we created for the purpose of testing linkages with Russian actions. We then assess those hypotheses about Russian coercive signaling, as described in Chapter Two, that lend themselves to statistical analysis. We conclude with a summation of the findings and their implications for understanding Russian behavior.

Data Collection and Availability

Data Sources

To analyze Moscow’s signaling behavior, we collated data on incidents involving Russian forces from several sources. We sought to capture several types of activities that might qualify as coercive signals, such as Russian
intercepts of U.S. or allied aircraft, Russian aircraft activity near U.S. or allied airspace, incidents involving U.S. or allied ships and Russian aircraft or ships, and Russian exercises. We used relevant existing data sets that were deemed the most comprehensive and thus gave us the broadest coverage of all potentially relevant signaling incidents between Russian and U.S. or allied forces. We initially erred on the side of over-inclusion; irrelevant incidents were excluded during the coding process. We supplemented these data sets with events described in English- and Russian-language press accounts. The data sources that we used are outlined in Table 4.1.

We combined the data from these various sources into a single data set and consolidated duplicate events. In some cases, a single data source would include multiple records for the same event to denote that the event had multiple parts. We consolidated these events into single records if they shared the same participants, date, event type, and location. In other cases, multiple data sources included records for the same event. We consolidated these into single records if they clearly referred to the same event. When it was unclear whether to consolidate a set of records, we resorted to the judgment of subject-matter experts. In total, these sources produced a set of over 1,000 observations related to Russian military incidents from 2010 to 2018.

It should be noted that these data present inherent limitations. If the governments involved decide not to make a given incident public, we have no means of recording it in our data set. We note that different governments have employed varying standards for releasing information to the public about such incidents; within the U.S. military, even entities (like the combatant or component commands) often do not consistently report these events. Therefore, it is likely that our data are far from complete, and that they overstate the relative quantity of incidents involving governments—or particular entities within governments—that are more transparent.

The somewhat arbitrary or at least changing standards and operating procedures for military aerial intercepts present another challenge for our data collection effort. For example, Russian LRA training flights generally only become public knowledge when they are intercepted by U.S. or NATO fighters, and the threshold for the conditions that prompt an intercept vary between countries and over time. In the U.S. case with the Alaska ADIZ, it appears that the commander of U.S. Northern Command has a significant
<table>
<thead>
<tr>
<th>Source</th>
<th>Period</th>
<th># of Events in Data Set</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Global Zero Military Incidents Project</td>
<td>2014–2018</td>
<td>713</td>
<td>As stated on its website, “the Global Zero Military Incidents Project gathers and analyzes information on publicly-known military incidents involving nuclear weapons countries as well as those under the U.S. nuclear umbrella to better understand conflict risk among nuclear-armed states.” Emma Claire Foley, a program associate at Global Zero and leader of the Global Zero Military Incidents Project, provided the raw data.</td>
</tr>
<tr>
<td>European Leadership Network Gray Zone data set</td>
<td>2010–2018</td>
<td>418</td>
<td>The European Leadership Network Gray Zone Data set records cases of “gray zone” Russian and NATO activity that do not involve the conventional use of force. The data set mainly comprises aerial incidents, such as airspace violations and aggressive aerial intercepts, but includes some land and sea incidents as well. Paul Normolle, a researcher at the Matthew B. Ridgeway Center for International Security Studies at the University of Pittsburgh, shared the data with us. Normolle and his team had created this data set for the European Leadership Network.</td>
</tr>
<tr>
<td>American Security Project Russia Military Incident Tracker</td>
<td>2012–2018</td>
<td>266</td>
<td>The American Security Project Russia Military Incident Tracker is a web-based map of “events in which elements of the Russian military (Naval/Air/Ground) have created an elevated level of risk through maneuvers that may potentially threaten US and allied forces and their sovereign territory.” We obtained these data by downloading the file used to generate the map and then writing an R script to extract the underlying event data.</td>
</tr>
<tr>
<td>Japan Air Self-Defense Force</td>
<td>2016–2019</td>
<td>40</td>
<td>We collated data on Japanese aircraft scrambles to intercept foreign aircraft from the official press releases of the Japan Air Self-Defense Force. The press releases are from fiscal years 2016 through 2019 but also contain data from earlier years.</td>
</tr>
<tr>
<td>News articles</td>
<td>2010–2018</td>
<td>149</td>
<td>We searched news databases, including NexisUni (formerly LexisNexis) and the Russian-language Integrum, to find events not covered in the other data sets.</td>
</tr>
</tbody>
</table>

amount of discretion in setting the threshold. As ADM James A. Winnefeld Jr., who held that post in 2010, said,

> If we intercept every single flight that comes out in our direction, then we’re really just feeding into their propaganda. . . . So we intercept them when we feel like we ought to, and we have various criteria that we use for that, to include just rehearsing our own skills to be able to do that. [In general, however,] we just leave them alone.1

So our data on Russian flights, and particularly bomber flights, are both incomplete and not necessarily reflective of overall LRA activity.

We began to refine the data by removing events that did not meet our definition of a coercive signaling incident. Incidents deemed out of scope include incidents involving Russia and a non-ally of the United States, missile tests, or interactions involving civilian ships or aircraft.

We then coded all the in-scope incidents in our data set using a variety of relevant metrics. As shown in Table 4.2, we classified air incidents by the type of Russian aircraft involved, such as fighters, LRA, or transport; and the types of behaviors of the Russian aircraft, including whether the aircraft had its transponder on, whether the Russian pilot had filed a flight plan, if there was radio contact, and if the aircraft was armed.2 We also collected information about the “directionality” of the events, such as whether the event began with Russian aircraft in the air that were then intercepted by U.S. or allied aircraft or vice versa. Similar dimensions of incidents were collected for naval interactions at sea and Russian exercises, such as the directionality of the interaction, the assertiveness of Russian forces, the location of the incident, and whether the incident was accompanied by a

---


2 Whether an aircraft was armed is a classification that largely only applies to Russian fighter aircraft in which the weapons are easily visible in “wings dirty” incidents. ISR aircraft generally are not armed, and LRA aircraft have internal weapons bays that make their weapons status impossible to discern from third-party reporting.
(subsequent) statement from Russian officials. Within all domains, \(^3\) we classify the size of the Russian force as small, medium, or large.\(^4\)

After collecting these data, we classified each incident along a scale of assertiveness to isolate the most-problematic Russian behaviors. First, we split the events by domain, which allows for the matching of Russian and U.S. or allied activity by domain to determine whether there are symmetrical linkages. Second, we classified each event by the assertiveness of the Russian behavior. We deemed naval and air incidents as *low-level assertive* when they were publicly described by U.S. or allied officials as dangerous or unsafe; when armed Russian aircraft were involved; or when we could document a failure to establish radio communications within visual contact, which would be a violation of INCSEA (but a relatively minor one). We classified air and naval incidents as *high-level assertive* when we could document serious violations of INCSEA and PDMA provisions: coming close

---

3 Domains here refers to air, sea, or land.

4 For more information on the classification of force sizes, see Table A.1.
enough to risk collision with aircraft or ships, hindering the formation of ships, interfering with communications, or simulating an attack. For the land domain, we focused on Russian exercises that involved ground forces because there are no direct encounters with U.S. or allied forces in this domain. We focused on those exercises that cause the most concern: namely, unannounced, no-notice snap exercises. Such drills could be interpreted as mobilization for war; indeed, they were used as cover to prepare the force that intervened in Ukraine in 2014. We further classified snap exercises as “assertive” when they took place in a region on Russia’s western borders.\(^5\) Table 4.3 shows the details of the coding breakdown along the escalatory structure we established for air and sea incidents, and Table 4.4 shows the breakdown of our 832 in-scope incidents by domain and assertiveness.

To test for possible links between Russian behavior and U.S. or allied behavior, we also created original data sets of blue and green activities.


### TABLE 4.3

**Classification Structure for Assertive Air and Maritime Incidents**

<table>
<thead>
<tr>
<th>Assertiveness Level</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low-level assertive</td>
<td>• Failing to establish radio communications while in visual contact</td>
</tr>
<tr>
<td>incidents</td>
<td>• Described by U.S. or allied officials as dangerous, unsafe, or unprofessional</td>
</tr>
<tr>
<td></td>
<td>• Armed Russian aircraft involved</td>
</tr>
<tr>
<td></td>
<td>• Exercise scenario involves conflict with the U.S. or allies</td>
</tr>
<tr>
<td></td>
<td>• Alleged violation of U.S. ally’s airspace or maritime boundaries</td>
</tr>
<tr>
<td>High-level assertive</td>
<td>• Close enough to risk collision</td>
</tr>
<tr>
<td>incidents</td>
<td>• Hindering formations of ships of another state</td>
</tr>
<tr>
<td></td>
<td>• Simulation of attacks, such as aiming guns, missile launchers, or torpedo tubes</td>
</tr>
<tr>
<td></td>
<td>• Interfering with the communications or command and control networks of another party (e.g., jamming)</td>
</tr>
</tbody>
</table>
These actions form many of our independent variables because multiple hypotheses posit that the rationale behind Russian actions are responsive in nature to blue/green behavior. For the air domain, we sought to document ISR and bomber training missions along Russia’s periphery. For this purpose, we used the Logistics, Installations and Mission Support—Enterprise View (LIMS-EV) database, which tracks takeoffs and landings of U.S. Air Force (USAF) aircraft around the world.\(^6\) LIMS-EV provides the date of the flight, the airframe type, and the base(s) used for takeoff and landing. There are several limitations to these data. First, they cover only USAF flights, not those operated by the U.S. Navy—which flies EP-3 and P-8 ISR platforms near Russia—or those of U.S. allies, and thus is an incomplete picture of relevant blue air activity and provides no information on green actions. Second, the database does not provide the flight plans, only the location of takeoff and landing. However, it is the only available unclassified data set on

\[^6\] LIMS-EV is an unclassified logistics database maintained by the USAF for the purpose of centralizing logistics data. For the purpose of our analysis, we pulled database-formatted information on individual sorties performed by the relevant Mission Design Series. These track takeoff and landing locations, as well as other data associated with a given sortie. We tied these data to airport ICAO codes, Global Positioning System coordinates, and other relevant geographic markers to establish the number of relevant flights in the region (Defense Acquisition University, “Logistics, Installations and Mission Support—Enterprise View,” database, last updated May 31, 2017).

\[
\begin{tabular}{|c|c|}
\hline
Total Incidents by Domain & Breakdown of Incidents by Assertiveness Within Each Domain \\
\hline
713 air & 615 non-assertive \\
& 79 low-level assertive \\
& 19 high-level assertive \\
\hline
56 sea & 41 non-assertive \\
& 12 low-level assertive \\
& 3 high-level assertive \\
\hline
63 land exercises & 24 scheduled \\
& 27 regular snap \\
& 12 assertive snap \\
\hline
\end{tabular}
\]
blue flights, and it tells us the general location of operations for a variety of important platforms. For our purposes, we tracked the number of takeoffs and landings for USAF bomber and ISR aircraft at bases within the EUCOM area of responsibility (AOR).

Although USAF bomber and ISR aircraft fly near Russia's Pacific coast, we posited that the majority of flights taking off or landing at bases in U.S. Indo-Pacific Command (INDOPACOM) were not related to Russia; whereas it is plausible that most flights from EUCOM bases are. However, the exclusion of U.S. flights off the Russian Pacific coast does represent a third limitation to our data. But the data on EUCOM takeoffs can be used to determine whether assertive Russian incidents are correlated with the pattern of U.S. aerial activity in Europe. (For readability, we use *U.S. flights* in the rest of this report when referring to the flights that are covered by the LIMS-EV data.)

Second, for the land domain, we collected information on blue and green military exercises in Europe from a variety of sources. We gathered information on NATO exercises (and selected member-state exercises) from the 2016–2019 editions of the NATO Secretary-General’s Annual Report, along with NATO press releases. Pre-2016 NATO exercises and other joint military exercises involving the United States were available through the Defense Visual Information Distribution Service (DVIDS) website, which consolidates press releases and other public affairs products from across the U.S. Department of Defense. We also searched the U.S. Department of Defense, U.S. Army, and U.S. Army Europe websites for press releases on events that were not posted to DVIDS. When these sources lacked information on a particular exercise, we consulted press reporting or independent military outlets, such as *Stars and Stripes* and *Army Times*. Together, these sources produced a relatively robust set of data covering blue and green land-based exercises in Europe from 2010 to 2018, although we did not include indi-

---

7 The specific aircraft that we included were B-52, B-2, B-1, RC-135S, RC-135V/W, and RC-135U.

vidual NATO member-states’ activities that were not covered in the NATO annual reports.

We coded these data first by location, in terms of the host country’s proximity or geopolitical significance to Russia: whether the host borders Russia, was formerly part of the USSR, or was formerly a member of the Warsaw Pact (but not a former Soviet republic). We also coded whether the exercise was a NATO exercise and, if so, whether it included non-NATO participants. We also coded the exercises based on whether they featured activities that Russia has identified as particularly challenging to its security interests.9 These two metrics provide a subset of exercises that could be seen as troublesome to Russia and thus possibly merit a response.10

Third, for the naval domain, we focused on U.S. Navy ships’ presence in the Black and Baltic Seas, arguably the two most sensitive maritime areas for Russia, from 2010 to 2018. Data documenting the deployment of U.S. Navy ships were gathered from five sources. First, we searched the publications USNI News and Stars and Stripes for reports on U.S. Navy ship deployments to the Black and Baltic Seas. Second, official press releases from the Sixth Fleet were sourced from the fleet’s online archive of press releases and ProQuest’s Military Database.11 In general, these reports provided information on where ships were deployed, the number of ships deployed, the date ships entered the area of operation, and a general description of the ships’ activities while deployed.

9 The activities we identified as problematic for Russia were (1) practicing forward movement of forces within Europe to the East or from the continental United States to Europe and (2) rehearsing reinforcement of forces in Europe, particularly from the continental United States.

10 A note on data availability: Data on blue/green exercises become more difficult to obtain further back in time. Although there are likely some exercises missing from the data in the earlier period covered by our analysis, the same can be said for the data on assertive incidents. Bias because of this data-availability issue is thus less of an issue than if data in one set were more accessible than the other.

Entry and exit dates for ships operating in the Black Sea were cross-referenced with entries from the *Bosphorus Naval News* blog. Based in Turkey, *Bosphorus Naval News* aggregates amateur reports of military ships entering and exiting the Black Sea through the Bosphorus Strait since 2014.

We coded each entrance to one of these bodies of water by date of entry and exit from the area of operation, number of ships in a deployment, whether a surface ship was Aegis-capable, and whether the deployment was in support of a military exercise. Aegis-capable U.S. Navy surface ships are equipped with Tomahawk land-attack cruise missiles and SM-2 ballistic missile defense (BMD) interceptors, and thus are particularly concerning to the Russian military. Entry and exit dates were extrapolated from the descriptions provided by the news source when possible, if not directly provided. For Black Sea operations from 2010 to 2013, an exit (entry) date was calculated based off the 21-day limit placed on U.S. operations in the Black Sea by the Montreux Convention, if an entry or exit date was not provided by the source. Information on Aegis capability was extrapolated from ship classification. *Arleigh Burke*-class destroyers and *Ticonderoga*-class cruisers were assumed to be Aegis-capable.

In addition to these original data sets, we also compiled existing data on other potential drivers of Russian behavior. We used several statistical proxies for changes in Russian military capabilities and state capacity: the price of oil (because revenues from taxes on oil and gas during the period under investigation made up nearly half of the federal budget); the percentage of Russian gross domestic product (GDP) spent on defense; and the average annual training flight hours for Russian pilots of both LRA and tactical aircraft, a useful quantitative metric of the capacity of the Russian Aerospace

---


Forces (VKS). As discussed in the following section, these variables can be used to test linkages between Russia’s military capacity and its behavior. We further relied on the Levada Center’s measure of Putin’s approval ratings to examine possible connections with domestic political dynamics.


We converted our original data set on Russian activities into a variety of event-count variables, which tabulate the number of times certain actions occurred on a monthly basis. For instance, in August 2017, there were 31 separate incidents coded within the data set, 13 of which involved Russian fighter jets, ten that involved Russian intelligence-gathering aircraft, and then a series of counts for other types of incidents. Because most of the types of incidents (e.g., serious violations of INCSEA or armed Russian aircraft) in the data are rare, the number of incidents per month are often clustered between zero and two, with a decline in the number of months with more incidents. Figure 4.1 demonstrates the distribution of incidents: High numbers of observations are at the lower end of the scale and there are fewer observations of higher counts.\(^\text{17}\) In most cases, we provide the incident rate ratio (IRR), which exponentiates the coefficient and creates a more substantive estimate of the results. The IRR estimate gives an indication of the expected increase in the dependent variable per unit increase in the independent variable.\(^\text{18}\) As a hypothetical example, for every increase in one

\(^{\text{17}}\) When the data are distributed in such a manner, there are two main options for modeling, and we used both in this report on the basis of the specific distribution of each dependent variable. The first is the \textit{negative binomial}, which is a general type of distribution that results from a series of event trials in which only 0 and 1 are possible outcomes. The resulting distribution of counts over certain periods of time have a high number of 0s and 1s with a declining number of higher counts. The second is the \textit{Poisson distribution}, which is a more specific type of negative binomial where the mean and the variance are equal to one another, but with the same kind of decline function that appears in Figure 4.1. Given that most of the dependent variables in our data are distributed in this way, Poisson and negative binomial regressions are used in most models, depending on the results of statistical tests showing the goodness of fit for each. Goodness-of-fit tests for determining Poisson or negative binomial in these cases are the Deviance goodness-of-fit test and the Pearson goodness-of-fit test. When both tests are insignificant, it means that Poisson is appropriate. When it is significant, negative binomial is used. In some cases, Poisson models do not converge, which produces no results. When this is the case, negative binomial is also used. In some rare instances, the dependent variable is normally distributed, in which case the modeling choice will be noted. In all cases, time-series models are used to correct for time dependence.

\(^{\text{18}}\) The IRR is interpreted relative to 1.0, the precise value that signifies no change in the respective dependent variable. Values greater than 1.0 indicate an increase in the dependent variable and those less than 1.0 reflect a decrease.
U.S. ISR flight, we could see a 5 percent increase in Russian exercises. These types of results give a more substantive and tangible understanding of the quantitative analysis.

### Hypothesis Testing

Of all the hypotheses and alternative hypotheses that are described in Chapter Two, tactical compellence (H1a) and provocation for intelligence collection (AH4) cannot be tested with quantitative analysis. The nature of H1a—that Russian behavior is conducted for the purposes of changing U.S. or allied actions on a very tactical level, such as forcing a change in flight headings—does not lend itself to analysis of patterns of behavior. AH4, that Russia is looking to provoke a U.S. response to collect intelligence, is also not testable using the data we have available; we do not have comprehensive coverage of U.S. reactions and nonreactions to Russian behavior. We generally know about such incidents because of the reaction (e.g., an intercept). To test
AH4, we would need to examine the types of Russian behaviors that produce intercepts compared with a background of routine actions that do not.

Hypothesis 1b: Operational Compellence

H1b is that Russian behavior in a given coercive signaling incident is driven by the objective of compelling a change in a pattern of U.S. or allied behavior for the purposes of dissuading future actions similar to the ones the U.S. or allied forces are engaged in during the incident. For example, Russian fighters fly low over an Aegis-equipped U.S. destroyer in the Black Sea to convince the United States not to send such ships back to the Black Sea in the future because of the risk of accidents or escalation. Unlike with tactical compellence, H1a, which posits a relationship between Russian and U.S. or allied behavior particular to a given incident, the collected data lend themselves well to tests of this hypothesis. In accordance with the coercive signaling literature discussed in Chapter Two, states can indicate their resolve on certain issues by progressively raising the costs and risks of the opponent continuing to engage in the behavior that the signaling state finds objectionable. Since the behavior itself is what that state finds problematic, the risks that it raises for the target are more likely to be directly connected to the pattern of behavior that is at issue.

More specifically to this case, by raising the costs and risks for the United States and its allies associated with continuing the activity, Moscow aims to cause them to reconsider undertaking it again in the future. By making certain activities more dangerous, onerous, or otherwise costly for the United States, Russia could be seeking to affect the cost-benefit calculus that goes into decisionmaking regarding the activity.

Given that these activities (according to H1b) aim to address specific patterns of behavior rather than a general issue like reputation, we would expect the Russian behavior to be more symmetrically responsive to U.S. actions. For instance, if aggressive Russian intercepts of U.S. ISR flights in the Baltic Sea are driven by a desire to dissuade the United States from continuing to fly in that area, we should see an increase in Russian assertiveness if U.S. flights in that area become more frequent. Such responses should be in the same geographic region and in the same domain, aiming to make it clear that if the U.S. continues the pattern of behavior, it will be increas-
ingly risky going forward. If this hypothesis is an accurate reflection of Russian motives, we would then expect to see a positive statistical association between assertive Russian behavior and U.S. actions in the same regions and in the same domains.

As we can see in Table 4.5, there is a high degree of support for this hypothesis: We see positive and significant statistical associations between U.S. ISR and bomber flights in Europe and assertive Russian air incidents in Europe. Looking at these results in Table 4.5, we can see that this association largely lies on the lower end of the assertiveness spectrum that is used as the dependent variable in Model 2. Model 3 uses a dependent variable of only high-level assertive incidents, and the results are not significant. Model 1 pools all types of assertive air incidents and is significant because it has the higher number of low-level incidents, which drives the results. This is consistent with expectations that weaker states demonstrating their resolve will create more-risky incidents at lower levels of escalation to avoid escalatory spirals that could lead them into a conflict that they might well lose. Low-level assertive harassment thus stands as a way of increasing the costs for the United States of continuing its pattern of behavior that Russia objects to, while shying away from the possibility of actually instigating a serious incident or escalation.

---

19 A note on lagging Russian actions in our statistical models: We do not lag the observations of Russian assertive incidents in these models unless otherwise indicated because it is not theoretically informed. Our data are pooled on a monthly basis, and Russian patterns would not be expected to take a month to manifest. We expect a simultaneous effect as patterns of Russian activity meet patterns of U.S. activity as part of symmetrical resistance. The possibility of endogeneity likely is not present here because the U.S. side of the regression is largely constituted by defenseless ISR aircraft that are vulnerable to assertive behavior. The U.S. or allied response to assertive behavior would not be likely to fly more ISR flights. Instead, it would be to have more-active air defense and intercepts, which is not captured in the regression, thereby making endogeneity unlikely.

20 The scarcity of observations for this dependent variable produces standard errors that are almost three times higher than those of the other two models. This result does not definitively mean that no relationship exists, but we find no evidence of such a relationship, given the data available.

21 Powell, 2015.
On a substantive level, each U.S. ISR or bomber flight in Europe corresponds with an expected 0.5 percent increase in the number of low-level assertive air incidents in the area. Although this seems like a small amount, throughout this period, the United States flew an average of 80 flights per month in Europe with a high of nearly 300 in one month. In many months with a lower level of U.S. ISR and bomber flights in Europe, there are no assertive air incidents from the Russian side at all. In months when the United States was flying fewer-than-average ISR and bomber flights in Europe, 74 percent of such months saw no assertive Russian activity in the air. However, in months with a higher-than-average number of U.S. ISR and

<table>
<thead>
<tr>
<th>Model 1</th>
<th>Model 2</th>
<th>Model 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>U.S. flights in Europe</td>
<td>0.00575*</td>
<td>0.00577*</td>
</tr>
<tr>
<td></td>
<td>(–0.00278)</td>
<td>(–0.00291)</td>
</tr>
<tr>
<td>Crude oil price</td>
<td>0.0266**</td>
<td>0.0248**</td>
</tr>
<tr>
<td></td>
<td>(–0.00905)</td>
<td>(–0.00949)</td>
</tr>
<tr>
<td>Putin's approval rating</td>
<td>0.0895***</td>
<td>0.0846**</td>
</tr>
<tr>
<td></td>
<td>(–0.0252)</td>
<td>(–0.0259)</td>
</tr>
<tr>
<td>Defense spending as percentage of GDP</td>
<td>102.1***</td>
<td>97.82**</td>
</tr>
<tr>
<td></td>
<td>(–29.25)</td>
<td>(–30.8)</td>
</tr>
<tr>
<td>Russian tactical flight hours</td>
<td>0.0327</td>
<td>0.0314</td>
</tr>
<tr>
<td></td>
<td>(–0.0188)</td>
<td>(–0.0195)</td>
</tr>
<tr>
<td>Constant</td>
<td>–16.92***</td>
<td>–13.56**</td>
</tr>
<tr>
<td></td>
<td>(–3.518)</td>
<td>(–4.322)</td>
</tr>
<tr>
<td>Observations</td>
<td>99</td>
<td>99</td>
</tr>
</tbody>
</table>

NOTE: *p < 0.05, **p < 0.01, ***p < 0.001. U.S. flights are takeoffs from EUCOM bases of USAF ISR and bomber flights. Tests indicate the most appropriate specification for Model 1 is a time-series Poisson regression. Models 2 and 3 use time series-negative binomial regressions per the goodness-of-fit tests specified in the Model Selection section. For each model in this table, the coefficient estimate is reported.
bomber flights, only 43 percent contained zero assertive air incidents. In other words, as the United States flies more ISR and bomber flights in this area, assertive air incidents involving Russian forces can be expected. We can see the threshold in Figure 4.2, which shows that, when the number of U.S. flights reaches 100 per month, we can expect to see at least one Russian assertive air incident. At the lowest end of ISR and bomber flight activity, there are usually no Russian assertive air incidents. As the number of U.S. ISR and bomber flights increases, so do the expected number of assertive Russian incidents in the air.

Similarly, U.S. Navy activity around the Russian periphery corresponds with an increase in assertive incidents in the same domain from Russian forces but only for Aegis-capable U.S. ships. Figure 4.3 demonstrates the expected increase in assertive Russian sea incidents as a product of the presence of Aegis-capable ships. These results show that each Aegis-capable U.S. ship in the Black or Baltic Seas in a given month produces nearly a 200 percent

**FIGURE 4.2**

Predicted Russian Assertive Air Incidents in Europe, by Number of U.S. Flights

![Graph showing predicted Russian assertive air incidents in Europe by number of U.S. flights.](image)

NOTES: CI = confidence interval. U.S. flight numbers cover takeoffs of USAF ISR/bomber flights from EUCOM AOR bases. A monthly basis is used in the figure.
expected increase in Russian assertive sea incidents there. Put differently, the average number of assertive Russia sea incidents in the Black or Baltic Seas in a given month is seven times higher when an Aegis-capable ship is present there. The dots in this figure represent the average estimated increase, with the tails representing the 95 percent CI. This means that, with 95 percent confidence, we can be sure that the increased Russian assertive activity relative to the presence of Aegis-capable U.S. ships falls within this range. Although it is a wide range, we can be highly confident that the effect of Aegis-capable U.S. ships in the Black and Baltic Sea on Russian assertive sea action is not zero. Alternatively, we also see that the tails in Figure 4.3 for the models estimating the effect of non-Aegis–capable U.S. ships does overlap

**FIGURE 4.3**

**Correlation Between Russian Naval Incidents and U.S. Navy Activity in Europe**

NOTE: All models in this set use time-series–negative binomial regressions per the goodness-of-fit tests outlined previously. Results in this figure are reported IRR. The models featuring high-level assertive incidents as the dependent variable do not converge, so there are no results to report. High-level assertive incidents are included in the pooled dependent variable of all assertive incidents, which produced nearly identical results to the low-level assertive incidents, indicating little impact of high-level assertive incidents on the relationship. Full results are in Tables A.2, A.3, and A.4.
with zero, which means that we cannot be certain that there is an effect of these types of ships on Russian assertive behavior at sea. This is an important finding because it shows a distinction in Russian behavior depending on the type of U.S. ship in the area and shows that the likely increase in assertive Russian action in response to the presence of Aegis-capable U.S. ships is a relatively substantial one.

Lastly, we assessed whether there is a pattern of within-domain responses in Europe when it comes to land exercises. Although there is no correlation between all blue/green land exercises in Europe and Russian snap exercises throughout this period, there are correlations across specific types of blue/green land exercises. Specifically, Russian forces seem to respond with snap drills (including ones along its western frontier, which we call assertive snap exercises) of their own to exercises conducted in sensitive locations—the former USSR and those states bordering Russia. Additionally, those land exercises that involve non-NATO members or include the specific activities we categorized as problematic to Russia seem to prompt an associated pattern of Russian snap exercise activity.

In Figure 4.4, we see the expected increase in Russian snap and assertive snap exercises that come in conjunction with these different forms of blue/green activities. For each type of blue/green exercise in a given month, the dot represents the average increase in expected Russian snap or assertive snap exercises in that month. Tails that overlap with 0 are those that cannot confidently be said to have an effect on the number of snap and assertive snap exercises per month. Three categories of exercises have some effect on non-assertive snap exercises (i.e., those not taking place on Russia’s western border): those involving non-NATO member-state participants, those that took place in former Soviet republics, and those in a state bordering Russia. The expected increases in corresponding Russian non-assertive snap exercises for these categories hover between 50 and 100 percent for each blue/green exercise. In each case, the tails on each estimate do not overlap with 0. This indicates that we can be confident that there is indeed an increase in Russian snap exercises that correspond with these types of blue/green exercise activity. Because the tails of each estimate do not overlap with 0, the

---

22 Results are presented in Table A.5.
results indicate a 95 percent confidence that there is a statistically significant effect. However, the only type of blue/green land exercises that produces a statistically significant increase in assertive snap exercises were those held in states bordering Russia. This result suggests that there is a symmetrical pattern of Russian snap exercises on its own borders in association with blue/green exercises that occur on the borders of Russia. The only variable for which there is no statistical correlation with Russian snap or assertive snap exercise activity is the number of countries participating in the blue/green exercise.

It is also possible that there could be a symmetrical relationship between U.S. bomber activity in Europe and Russian LRA flights. While bomber flights from both the United States and Russia span multiple geographic

FIGURE 4.4
Russian Exercises and U.S. or Allied Exercises in Europe

NOTE: The Y-axis shows characteristics of U.S. or allied exercises. Exercises assessed all had land components. Assertive snap exercises (green dots and tails) are those that take place in regions on Russia’s western borders. Non-assertive snap exercises are those that take place elsewhere in Russia. All models use time-series Poisson regressions per goodness-of-fit tests, with the exception of the model estimating the effect of exercises in the former USSR on assertive snap exercises, which uses a time-series negative binomial. Results reported in Figure 4.4 are IRR. Full results are in Tables A.6 and A.7.
regions, any correlation between U.S. bomber flights and Russian LRA activity would indicate a tit-for-tat symmetrical relationship that potentially points to a Russian dissatisfaction with the way U.S. bombers are employed along the Russian periphery during Bomber Task Forces rotations or DFE (which, as noted in the previous chapter, one Russian analyst called “dynamic harassment”). However, because of the way that LRA flights are scheduled and the loose relationship in terms of geography, we should not expect LRA flight responses to come within the same month as U.S. bomber flights. When we lag U.S. bomber activity by a month, there is no correlation with LRA flights, indicating that there is likely no relationship between them on a systematic basis. As a robustness check, we also measured whether there was a correlation within the same month, and the result there also lies outside standard levels of significance. In short, there is no statistically significant link between LRA activity and U.S. bomber flights in Europe.

Overall, the results of these statistical tests are consistent with what we would expect to see if H1b (operational compellence) were true. There are patterns of assertive incidents from Russian forces that coincide with specific behaviors of the United States and its allies to which Russia objects. These Russian incidents come in the same geographic regions and in the same domains as U.S. or allied activity, indicating a high degree of symmetry and directness in Russian responses. These assertive Russian actions generally come at lower levels of escalation, they are consistent in their correlation to U.S. patterns over time, and they demonstrate the type of behavior we would expect if the Russian aim is to signal dissatisfaction with a pattern of U.S. and allied behavior, the goal being to raise the risks involved in continued actions on Russia’s periphery and thus dissuade future similar actions.

Hypothesis 1c: Coercive Diplomacy

H1c (coercive diplomacy) posits that Russia seeks to force negotiations with the United States and its allies over military activities that it sees as problematic. Although this is similar to operational compellence in H1b in that both suggest that Russia is motivated by a desire to compel a change in a

\[23\] Results not shown here for brevity. Full results for all models are included in Table A.8.
pattern of U.S. or allied behavior, it differs in that it suggests that Russia’s desired outcome is a cessation to the perceived problematic activities via negotiations and mutual agreement. Unfortunately, there are not enough instances of specific diplomatic overtures during the period of investigation related to these types of incidents to conduct a comprehensive statistical analysis. However, a look at the trends in assertive air incidents in the Baltic Sea region, coupled with the one instance of a diplomatic overture related to air conduct in the same area, provides some limited support for this hypothesis. As we see in Figure 4.5, the largest spike in assertive air incidents in the Baltic immediately preceded a diplomatic overture (marked by the red line in Figure 4.5) related to Baltic air incidents.

Although the connection between the spike in assertive air incidents and the diplomatic overture appears suggestive, we cannot know for sure that the two are connected. First, one diplomatic overture is not enough to establish a statistical correlation. Second, the causation could be reversed, with the increasing number of air incidents prompting the Russian government

---

FIGURE 4.5
Baltic Sea Region Air Incidents and Russia’s July 2016 Diplomatic Overture

NOTE: The red line marks the date when Russia offered to begin talks about air incidents in the Baltic Sea region.
to seek a diplomatic solution, rather than the diplomatic solution being the priority going into a decision to increase its forces’ assertiveness in the air. Thus, we can only provide a suggestive connection that is consistent with coercive diplomacy, H1c. However, there have been further overtures since 2018 (the last year for which we have data), so future research might explore this link with more-robust conclusions.

Hypothesis 2: Deterrence

H2 suggests that Russia is engaging in general deterrence behavior in which it seeks to deter the United States from taking an action in the future that it has not taken in the past by demonstrating its capabilities to fend off an invasion or retaliate with nuclear forces. Most often, deterrence is about dissuading aggression. By definition, U.S. actions would not precipitate Russian actions according to this hypothesis. Essentially, this hypothesis posits that some Russian coercive signaling incidents are driven by Moscow’s desire to send a generalized deterrence signal to the United States. H2 is therefore not testable using the same subset of data used to examine H1. However, two other subsets, specifically LRA flights and routine and scheduled exercises, could be explained by this hypothesis. LRA flights—nuclear-capable Russian heavy bombers’ training missions—are consistent with a strategic deterrence message: demonstrating strategic capabilities to reinforce the consequences of aggression. Scheduled exercises, too, are coercive signals, but given the long-planned schedule, the deterrent message conveyed is similarly broad.

If general deterrence behavior (H2) represented an accurate account of Russia’s motives for conducting LRA flights and scheduled exercises, we would expect to see steady patterns of such deterrence behavior over time. By contrast, significant variation year to year would suggest that these activities are reactive to events; in other words, Moscow was using these signals

24 In this hypothesis, we are analyzing general deterrence behavior as opposed to immediate deterrence. Immediate deterrence would be for the purposes of dissuading an imminent attack. Instead, what we focus on here is a diffuse sense of threat that arises from the capabilities that the United States possesses rather than any impending action. See Michael J. Mazarr, *Understanding Deterrence*, Santa Monica, Calif.: RAND Corporation, PE-295-RC, 2018.
narrowly to send a compellent message. Therefore, we examined the overall pattern of these two subsets over the period covered by our data. It should be noted that while steady numbers over time are consistent with H2, alternative explanations for that consistency, such as unchanged training and readiness requirements, are also possible.

Our findings are broadly consistent with what we would expect if this hypothesis were true. Figure 4.6 demonstrates that LRA flights follow a relatively constant linear pattern over time, with some peaks and troughs, but the overall trend line between 2010 and 2018 is stable or slightly downward. While the peak of monthly LRA flights comes in late 2014, the period that follows has a higher rate of months with zero LRA flights. Thirty-one percent of months had no LRA flights in the later period compared with 20 percent in the earlier one, constituting a 50 percent increase in the rate of LRA flights being idle in a month. The same can be said of scheduled military exercises. We also tested the possibility that there was a statistically significant difference between the pre-2014 period and the post-2014 period. That year marked a watershed in Russia-West relations; the Ukraine crisis

**FIGURE 4.6**

Russian Long-Range Aviation Flights over Time

![Graph showing Russian Long-Range Aviation Flights over Time](chart.png)
entrenched a climate of unprecedented mutual hostility. If the number of LRA flights and scheduled exercises increased after 2014, that could suggest that these actions are a form of status signaling, i.e., H3. However, no significant change was detected in either type of activity between the two periods. This stability over time is consistent with a general deterrence message, which was equally relevant before relations worsened.

Figure 4.7 demonstrates that we do not see any statistically significant change in either scheduled exercises or LRA flights in the period from 2014 onward. (The tails in both cases overlap with zero.) In other words, the post-2014 period has no statistical effect on the expected number of scheduled exercises and LRA flights. Although the lack of change in these activities over time does not definitely prove that H2 is true, it is consistent with the idea that certain Russian activities are aimed at strategic deterrence of the United States and its allies.

FIGURE 4.7
Post-2014 Change in Russian Deterrent Activities

NOTE: Red line indicates no change after 2014. Both models use time-series Poisson regressions per goodness-of-fit tests. Results reported are IRR. Full results in Table A.9. Scheduled exercise totals here include exercises without a land component, in addition to exercises with a land component.
Hypothesis 3: Status Signaling

H3 posits that Russia is engaging in coercive signaling actions to signal its discontent with the global status quo. Such objections are not related to any particular activity, but instead they concern Russia’s place in the international system, the general character of U.S.-Russia relations, and specifically a perceived lack of acknowledgment of Russia’s great power status. On an empirical level, we would expect to see increases in the demonstration of weapons associated with Russia’s status claims after 2014, when Moscow’s discontent with the status quo became more manifest. If the underlying issue is a lack of respect given to Russia as a great power, Moscow will be keen to remind the world (and especially the United States and its allies) of its ability to act as a great power, using capabilities that are rare in the international system, such as long-range aviation, to extract concessions that would not otherwise be forthcoming in the absence of such status signals. If this hypothesis were true, we would expect to see a discernable increase in such behavior after 2014. Additionally, if this hypothesis were true, we could expect to see cross-domain, all-domain, and cross-geographic responses to patterns of U.S. or allied military activity, because Russian forces consistently engage the United States and its allies by whatever means present themselves to receive the benefits of heightened status that would otherwise be absent. Instead of responding in kind or in theater to particular patterns of U.S. behavior that Moscow finds objectionable, its coercive signaling would be essentially unrelated to the nature of the U.S. activity.

As noted in the discussion of H2, there was a remarkably steady level of LRA flights over the entirety of the 2010–2018 period. When it comes to the display of status weapons, there is no evidence that Russia’s behavior has changed or demonstrates an overall dissatisfaction with the status quo, as we would expect if this hypothesis were true.

For cross-domain activities, the story is similar. As seen in Figure 4.8, there are few discernable connections between patterns of U.S. or allied activities in one domain and Russian activities in other domains. Even though many of the mean estimates show an effect of some of these variables on cross-domain Russian activity, the 95 percent CI represented by the tails overlaps with 0, indicating that we cannot be confident that these vari-
The only statistical correlation that is distinguishable from 0 is the connection between all global air incidents and U.S. naval activity in the Black and Baltic Seas. This is likely both a statistical artifact from the fact that the majority of incidents in the data are aerial in nature. Furthermore, most of these air incidents are routine in nature and do not involve assertive behavior on the part of Russian forces, such as the milk run from St. Petersburg to Kaliningrad.

NOTE: For each type of U.S. or green/blue activity in a given month, the dot represents the average increase in expected assertive behavior in that month. Tails overlap with 0 in all cases, indicating no statistical effect of the U.S. and green/blue activity on the expected number of assertive incidents in a month. All results reported in Figure 4.8 are time-series Poisson regressions, with the exception of the model testing the connection between the number of U.S. ships in the Baltic and Black Seas and assertive air incidents, which uses time-series negative binomial regression. All results reported are IRR. Sensitive land exercises are those that took place in the former USSR or in states bordering Russia.
sensitive and Russian assertiveness in the air. Thus, there is no evidence of a cross-domain connection between these activities, as we might expect if this hypothesis were true.

Second, there is little apparent connection between patterns of U.S. actions and Russian assertiveness in geographic regions other than where the U.S. activity takes place. If the motivation behind these assertive incidents were general Russian discontent with the global status quo, responses would not necessarily need to be tied to the geography of U.S. behavior. Instead, there might be targets of opportunity in another region, where assertive action could be taken to signal general dissatisfaction with the status quo. However, what we see is that Russian assertive behavior is tightly connected to the region and domains of specific patterns of U.S. action—where U.S. forces are active, Russia tends to respond in the same area. While there are high-profile outliers, like the incident involving the USS Chancellorsville in the Philippine Sea, far from Russian territory (see Chapter Five), there is little statistical connection between U.S. patterns in one geographical area and Russian responses in other areas.

Contrary to the lack of specific cross-domain or cross-geographic connections, there are some all-domain connections to U.S. military activities. Figure 4.9 shows that, for each U.S. flight in Europe in a given month, there is an average expected increase in all Russian assertive incidents and low-level assertive incidents of about 0.5 percent. This increase is statistically significant only at the lower level of assertiveness (red dot and tail) and in the pooled category of all assertive incidents (blue dot and tail). The significance of the pooled sample is likely a function of the larger number of lower-level assertive incidents. Furthermore, it is possible that the statistical relationship here is a result of the assertive incidents mostly taking place in the air. Thus, the statistical relationship might be more consistent with H1b, operational compellence, than any cross-domain responses we posited for status signaling.

---

26 Other cross-domain connections (air to land, sea to land, and land to sea) were also tested and found to have no connection. Results are reported in Tables A.10, A.11, and A.12.

27 Insignificant results are not shown. Full results across all models are in Tables A.13 and A.14.
Such a finding makes it even more important to examine the all-domain relationships with U.S. naval and ground activities. Figure 4.10 shows that naval presence is positively correlated with more all-domain (low-level and pooled) assertive incidents, but the CIs nearly overlap with 0, and the results are just within standard levels of significance. This indicates a relatively weak correlation. Figure 4.10 shows that land exercises correlate with more high-level all-domain assertive incidents, but the correlation here also is not particularly strong, indicating a less-than-robust finding; it is well below the significance levels seen in most of the results for H1b.

Overall, we see inconsistent support for H3 status signaling, with a few tests showing correlations in the expected direction if the hypothesis were true. However, many other statistical tests did not produce results that would indicate that H3 has robust support within the data that we have collected.
Alternative Hypothesis 1: Unprofessional Actions or Unauthorized Decisions

The first alternative hypothesis that we examine is that assertive Russian incidents are the product of Russian pilots or ship captains acting unprofessionally or making decisions without authorization from higher-ups in Moscow. If this hypothesis were true, we would expect to see few, if any, statistical relationships between trends in assertive Russian behavior and related U.S. or allied actions. If Russia’s coercive signaling is unrelated to broader political-military objectives, and thus largely a result of particular decisions of the individual pilots or captains, we would expect to see a lack
of correlations with related U.S. or allied actions (i.e., in the same domain or theater).

Much of the evidence relevant to this hypothesis has already been discussed in the analysis of H1b, operational compellence. Russian activity is closely related to the geographic and domain patterns of U.S. and allied behavior, with a growth in Russian assertive air incidents in Europe coming with increases in U.S. bomber and ISR flights in Europe. Similarly, spikes in assertive Russian naval behavior correspond to increased U.S. naval activity in the Black and Baltic Seas and growth in the number of Russian assertive exercises corresponds to increased blue/green exercises.

If the source of Russian assertiveness was the individual pilots and captains, we would also expect to see a consistency in the raw numbers of assertive incidents over time because particular pilots and captains routinely engaged in risky behavior during the broad interval. Instead, what we see in Figure 4.11 is a tight connection between U.S. flights and assertive Russian aerial activity. The blue line in Figure 4.11 is the raw percentage of U.S. flights encountering assertive Russian activities, and the red line is

FIGURE 4.11
Rate of U.S. Flights Encountering Assertive Russian Behavior
the linear trend, which shows a relatively consistent rate over time. In other words, with increases in U.S. activity, we see increases in Russian assertive behavior. If these incidents were the product of individual pilots, we would expect to see a decline in the rate of U.S. flights encountering assertive Russian activity. What we see is the opposite—a close connection between U.S. activity and Russian assertiveness. This provides further indication that assertive incidents are likely a result of policy decisions at higher levels because they are part of clear patterns that relate to U.S. and allied activities.

All this suggests that reckless or freelancing pilots and captains likely are not a main driver of these types of assertive incidents. The correlations that we have already identified suggest that these incidents do follow some identifiable strategic logic, which would not be the case if they were driven by the actions of rogue pilots and captains.

Alternative Hypothesis 2: Revival of Russian Military Capabilities

The second alternative hypothesis is that patterns in Russian coercive signaling behavior are simply a function of the Russian military’s capacity to engage in them. If this were the case, there would be significant correlations between Russian assertive incidents and increases in the capabilities of Russian forces and minimal correlations between assertive incidents and other factors. The implication of AH1 is that Russian forces are likely to engage in assertive behavior no matter what adversary forces do simply because they can, and therefore more capacity should translate to a greater number of assertive incidents.

Our statistical analysis of the three variables related to Russian capacity—the price of crude oil, defense spending as a percentage of GDP, and flight training hours—generally does not comport with the expectations of this hypothesis, with the exception of Russian defense spending as a percentage of GDP. As shown in Table 4.6, increased Russian defense spending produces an expected increase in global assertive incidents to a statistically significant degree, as shown by the coefficient estimates. In Table 4.6, the numbers in parentheses are the standard errors, and asterisks indicate confidence that the effect is statistically unlikely to be zero. This is the case for defense spending as a percentage of GDP, and the significance level is to a
degree indicating high confidence at beyond the 99 percent level. However, while defense spending as a percent of GDP is significant in these stand-alone models that contain only capacity variables, its significance varies when combined with other variables used in the hypotheses. For instance, Russian defense spending is insignificant when tested in the same regression as U.S. naval activity. Therefore, Russian defense spending does appear to have some effect on the likelihood of assertive incidents, although it does not appear to be determinative when other factors also are considered.

Contrary to the statistical significance (although low substantive significance) of Russian defense spending, other categories of capacity do not show any correlations with assertive behavior from Russian forces. We tested the price of crude oil against all assertive incidents and found no correlation. Furthermore, the average flight hours for tactical Russian pilots do not have an effect on the number of assertive aerial incidents. In short, a steady increase in pilot flight hours over the past decade, which is a proxy for capability, appeared to have no statistically meaningful relationship with air-to-air assertive signaling.

28 Flight hours model is in Table A.18.
Overall, there is evidence that Russian defense spending correlates with assertive incidents, but the substantive significance of this correlation is low, and the other variables that capture Russian capacity offer no support for this hypothesis. We therefore find little evidence that Russian behavior is driven mostly by the capacity of Russian forces. This finding, along with the extensive evidence in favor of geographic and domain connections between Russian actions and U.S. behavior, indicate that it is unlikely AH2 is driving the patterns we see in the data.

**Alternative Hypothesis 3: “Rally Around the Flag”**

Our third alternative hypothesis is that internal political dynamics drive assertive Russian behavior toward U.S. and allied forces. Specifically, we test the commonly encountered theory that Putin lashes out abroad to produce a “rally-around-the-flag” effect at home when his approval ratings are waning. If this were true, we would expect to see drops in Putin’s approval ratings precede a rise in the number of assertive coercive signaling incidents, because the drop in approval is what prompts assertive incidents in this hypothesis. The theory is that the Kremlin uses the incidents to create an atmosphere of confrontation with the West to consolidate flagging domestic support.

Instead, the model estimates displayed in Figure 4.12 show precisely the opposite dynamic. Within the period covered in this report (2010–2018), increases in Putin’s approval rating are associated with more assertive incidents in the month that follows. This correlation is specifically for the aggregated group of all assertive incidents and the lower-level assertive incidents, although not for the highest level of assertive incidents. On a substantive basis, we see the mean estimate for low-level assertive incidents (the red dot) at around a 5 percent expected increase in global assertive incidents per 1 percent increase in Putin’s approval rating. These findings are contrary to the idea that dips in Putin’s approval ratings spur assertiveness abroad. In fact, they might suggest that domestic support emboldens the Kremlin to act with more assertiveness when encountering U.S. or allied forces.

---

29 Lagging the period of approval in our models this way helps guard against endogeneity, which could suggest the opposite causation and support the diversionary hypothesis.
Conclusion

Using dozens of statistical tests of the various hypotheses, by far the most-consistent support is found in favor of operational compellence, H1b, i.e., that Russian forces are acting in a manner aimed at compelling a change in patterns of specific U.S. and allied behavior (see Table 4.7). These assertive actions directed at objectionable U.S. and allied behavior are intended to dissuade such behavior in the future by raising the costs and increasing the risks associated with it, and elevating the possibility of accidents that could result in an escalatory spiral. Nearly every model aligned to what we would expect to see if this hypothesis were correct: Russian assertive incidents were in the same domains and geographic regions as patterns of U.S. and allied behavior that Russia finds objectionable. Russia’s symmetrical responses are narrowly tailored to change the problematic (from Moscow’s perspective) patterns of U.S. and allied behavior.
This result is consistent with expectations in the literature as well; previous work demonstrates that countries seek to raise the risks at lower levels of escalation. This behavior demonstrates that the balance of resolve lies with the side raising the risk, even though the balance of capabilities favors the other side (the United States and its allies, in this case).\textsuperscript{30} In the absence of greater capabilities, the evidence is consistent with the literature in that it is a logical strategy for Russia to engage in the patterns of assertive behavior consistent with the operational compellence hypothesis (H1b).

Although there is a paucity of data to generate robust findings in support of coercive diplomacy (H1c), the logic of Russian activity comports with much of the literature’s expectations, and the available evidence is tentatively suggestive of a connection between assertive incidents and diplomatic overtures. While the \textit{n-of-one} diplomatic overture during this period makes any conclusion tentative, the correlation we find does further support the idea that patterns of Russian assertive actions aimed at changing specific types of U.S. and allied behavior including at the bargaining table.

Our analysis also supports the hypothesis that Russia is engaged in classic deterrence activities (H2). H2 notes that Russia seeks to deter future actions from the United States and its allies, and our expectations for behavior consistent with this hypothesis were borne out in statistical testing.

Multiple hypotheses find little to no support in our statistical testing. This includes status signaling (H3), which posits that much of Russia’s behavior is a function of a general discontent with the status quo. There are no strong patterns of Russian assertiveness that are not connected to patterns of U.S. and allied actions.\textsuperscript{31} The three alternative hypotheses also find little support. There is no evidence in support of the proposition that pilots and captains are systematically engaging in assertive behavior on their own initiative (AH1), and the only correlation between assertive incidents and capacity variables (AH2) is for Russian defense spending. A steady increase in pilot flight hours over the past decade, as a proxy for capability, appeared to have no statistically meaningful relationship with aggressive air-to-air

\textsuperscript{30} Powell, 2015.

\textsuperscript{31} The only exception is the collection of all Russian behaviors globally and U.S. and allied exercises in Europe, which is an extremely broad category and thus likely a spurious correlation.
signaling. Lastly, we can reject AH3 with high confidence because our evidence directly contradicts it: Increases in Putin’s approval ratings tend to precede increases in assertive behavior.

We thus find support for three drivers of Russian behavior:

1. compellence aimed at changing specific patterns of U.S. and allied actions
2. compellence for the purposes of encouraging a diplomatic negotiation related to those actions
3. general deterrence.

<table>
<thead>
<tr>
<th>Hypothesis</th>
<th>Findings</th>
</tr>
</thead>
<tbody>
<tr>
<td>H1b: Operational compellence: Compel a change in a pattern of behavior, usually to dissuade further action.</td>
<td>Consistent and robust evidence in support of this hypothesis.</td>
</tr>
<tr>
<td>H1c: Coercive diplomacy: Force a negotiation related to the ongoing activity.</td>
<td>Not enough information for robust statistical findings, but descriptive statistics are consistent with this hypothesis.</td>
</tr>
<tr>
<td>H2: Deter possible adversary aggression.</td>
<td>Consistent evidence in support of this hypothesis.</td>
</tr>
<tr>
<td>H3: Status signaling: Force an adversary to acknowledge Russia’s status.</td>
<td>Inconsistent support for this hypothesis. Most tests do not comport with expectations if this hypothesis were true.</td>
</tr>
<tr>
<td>AH1: Russian pilots or captains are acting unprofessionally or making decisions without authorization.</td>
<td>No support for this hypothesis.</td>
</tr>
<tr>
<td>AH2: Any increase in Russian incidents is purely a function of the revival of Russia’s military capabilities.</td>
<td>Some support for this hypothesis in terms of defense spending but not for other capacity variables.</td>
</tr>
<tr>
<td>AH3: These incidents are artificial attempts to stoke tensions with the West to create a rally-around-the-flag effect and bolster Putin’s ratings.</td>
<td>Evidence contradicts this hypothesis. Higher approval ratings seem to precede more assertive behavior.</td>
</tr>
</tbody>
</table>
Although operational compellence (H1b), coercive diplomacy (H1c), and deterrence (H2) find support in our statistical testing, it is critical to note that these hypotheses are not mutually exclusive, and the support they find in our analysis is not contradictory. Within the testing for each hypothesis, we examine different threads of the data depending on the theory involved. The process of producing empirical implications of each hypothesis also provides something of a typology to read Russian intentions in any particular engagement. When encountering U.S. or allied forces in the same domain along the Russian periphery, it is likely that Moscow is signaling a desire to force a change in those blue/green patterns. For example, a Russian fighter jet scrambling to intercept a U.S. ISR aircraft over the Baltic Sea and engaging in assertive behavior likely is aimed at raising the costs of such flights for the United States or prompting a negotiation. Scheduled Russian exercises and LRA flights are generally for the purposes of deterrence.

Overall, our statistical analysis of incidents between 2010 and 2018 suggests that Russia likely is engaging in assertive behaviors that are aimed at changing the pattern of U.S. and allied military activity along its periphery and sending general deterrence messages. These results give some guidance about the overall trends in the signals that Russia is sending to the United States and its allies. This chapter tested a set of empirical expectations based on each hypothesis; the results can serve as guides for reading the intentions behind individual incidents and can provide insight into the overall trends and potential motivations in Russian assertive actions over time.
CHAPTER FIVE

Case Studies

This chapter examines cases of Russian coercive signaling in detail to understand better Moscow’s motives, objectives, and methods. Selecting among the hundreds of incidents in our data set presented methodological challenges. First, to some extent, we had already selected on the dependent variable—in other words, all our observations are coercive signaling incidents; we do not have non-incidents in the data set by definition. Second, there are no directly applicable social scientific criteria for selecting among the cases in our data set. However, based on the diverse case selection technique, we chose three sets of incidents that involved different domains.¹ We also chose cases where there was interaction between Russian forces and U.S. or allied forces (as opposed to exercises, for example) because those are both more significant for U.S. interests and more documentation is available for them. Specifically, we looked at two incidents involving Russian air assets and U.S. naval vessels (air-surface); two incidents involving both sides’ naval vessels (surface-surface); and two incidents involving both sides’ air assets (air-air). We chose the following incidents to analyze: Russian harassment of the USS Donald Cook in April 2014 and April 2016, incidents between the USS Chancellorsville and the Russian ship Admiral Vinogradov in June 2019 and between the USS Farragut and the Russian ship Ivan Khurs in January 2020, and Russian intercepts of U.S. B-52 bombers in August 2020. We chose the two incidents involving the Donald Cook because they involve the same ship’s presence in areas of similar sensitivity for Russia, allowing us to control for potentially key variables. Surface-surface incidents are very rare,

and the two we chose are by far the best documented. The air-air incidents involved the same U.S. airframes and the same Russian airframes and took place on the same day, again allowing us to control for potentially significant characteristics of the cases.

Given the unique context of each case, our conclusions are not necessarily generalizable; Instead, we aim to supplement analysis of the quantitative data set by providing an in-depth discussion of specific cases to better understand Russia’s motives. We use the hypotheses generated in Chapter Two as the framework for analysis. (See Table 2.3 for reference.) Case study analysis, however, is not appropriate to test coercive diplomacy (H1c) and or the hypotheses pointing to a revival of Russian military capabilities or rally-around-the-flag effect (AHs 2 and 3). Those require large-\(N\) study.

Air-Surface

Case Description

The \textit{Arleigh Burke}–class missile destroyer \textit{USS Donald Cook} has experienced what the U.S. Department of Defense has described as unsafe or unprofessional behavior from Russian aircraft several times, the best documented of which we will analyze here. The \textit{Cook} is outfitted with advanced BMD capabilities, particularly an Aegis radar system and an MK-41 vertical launch system capable of firing Tomahawk cruise missiles and, since 2014, SM-3 ballistic missile interceptors.\textsuperscript{2} Russian officials have complained frequently about the deployment of such capabilities in proximity to its borders, citing both a threat to its strategic deterrent and a decapitation threat.

On April 12, 2014, the \textit{Cook} was harassed by a Russian Su-24 fighter jet. The incident occurred shortly after Russia annexed Crimea. Although not specifying Russia’s actions as the impetus for the \textit{Cook}’s transit into the Black Sea, a Pentagon spokesperson explained that its mission was to “to reassure NATO allies and Black Sea partners of America’s commitment to strengthen and improve interoperability while working towards

mutual goals in the region.”

Over the course of 90 minutes, one apparently unarmed Su-24 made 12 low-altitude passes within 1,000 yards of the Cook, while a second Su-24 flew at a higher altitude; a Pentagon spokesperson described the passes as “provocative and unprofessional” and “inconsistent with [Russian] national protocols and previous agreements on the professional interaction between our militaries.” The Cook did not receive a response after attempting to contact the Su-24’s cockpit. The ship was not, however, in immediate danger.

U.S. officials rejected the notion that individual pilots were making the decision to harass the ship alone, instead noting a pattern of behavior: “We’ve seen the Russians conduct themselves unprofessionally and in violation of international norms in Ukraine for several months.” When asked later whether he ordered the pilots to harass the Cook, Putin claimed he did not. “They [the Russian commanders] were behaving like hooligans,” he asserted. “They didn’t even tell me anything about it.”

Meanwhile, the then-commander of the Russian Black Sea Fleet (first deputy commander of the Russian Navy as of this writing), Admiral Vyacheslav Vitko, stated that Moscow “had to take actions to demonstrate capability and resolve in order to throw cold water on the Americans.” He continued, “as demonstrational actions, we employed naval attack aviation, which got close enough to [the Americans] to put them in range of the weapons systems.”

Almost exactly two years later, the Cook was again harassed by Russian aircraft, this time over the course of two days of exercises in the Baltic Sea. The Cook had been deployed to the region as a signal of commitment to U.S. allies and partners amid concerns regarding Russia’s activities. On

---


6 Rossiya 24, 2019.

7 Rossiya 24, 2019.

8 Winkler, 2017, p. 12.
April 11, 2016, the *Cook* was conducting deck landing exercises with Polish forces when two Russian Su-24 jets “made numerous, close-range and low altitude passes at approximately 3:00 p.m. local.”\(^9\) After the *Cook*’s commanding officer deemed one of the passes to be *unsafe*—meaning the incident was more dangerous than the *Cook*’s 2014 encounter with Russian jets, which did not receive the same designation—the exercises were suspended until the Su-24s left the vicinity.\(^10\)

The next day, two Russian KA-27 Helix helicopters circled at close proximity to the *Cook*, which the commanding officer deemed unsafe and


unprofessional, around 5:00 p.m. local time (see Figure 5.2 for an indication of the distance from the *Cook* that the helicopter flew).

Approximately 40 minutes later, two Russian Su-24 jets made 11 close-range, low-altitude passes of the *Cook*, which the ship’s commanding officer also assessed as “unsafe” and “unprofessional.”\(^1\) EUCOM reported that “the Russian aircraft flew in a simulated attack profile and failed to respond to repeated safety advisories in both English and Russian.”\(^1\) The Su-24s reportedly flew close enough to create wakes around the *Cook*, causing challenges for ongoing operations.\(^1\) In the opinion of one Pentagon official

---

\(^{11}\) EUCOM, 2016.

\(^{12}\) EUCOM, 2016.

\(^{13}\) “USS Donald Cook Buzzed Again by Russian Jets in Baltic,” *CBS News*, April 13, 2016.
interviewed for this report, the Su-24 passes amounted to hazing because of the speed of the passes and how close the jets came to the *Cook*.14

On April 13, 2016, a White House spokesman called the incident “entirely inconsistent with the professional norms of militaries operating in proximity to each other in international water and international airspace.”15 Via his spokesman on April 14, U.S. Secretary of State John Kerry called the incidents “unprofessional, needlessly provocative and, indeed, dangerous.”16 He also raised the issue during a phone call with Russian Foreign Minister Sergei Lavrov on April 15.17 In response, a Russian Ministry of Defense spokesperson disagreed with statements made by the United States, saying that the Russian jets changed course after noticing the *Cook* and complied with international norms. He also stated that the incident took place 70 km from a Russian naval base.18 He said “to be honest, the reason for such a painful reaction by our American colleagues is unclear. Being in operational proximity to the Russian naval base of the Baltic Fleet, the principle of freedom of navigation does not change the principle of freedom of aeronautics for Russian aircraft.”19

**Case Assessment**

The 2014 incident is more consistent with operational compellence (H1b), while the 2016 incident is better explained by tactical compellence (H1a). In 2014, Russia’s actions did not—and could not plausibly have been expected to—interfere with the *Cook*’s operations but seemed designed to raise per-

---


17 “Secretary Kerry’s Phone Call with Foreign Minister Lavrov,” U.S. Department of State, webpage, April 15, 2016.


ceived risks and costs and thus compel the United States not to send similar ships to that area in the future. The *Cook* had been deployed to the Black Sea as early as 2007 for military exercises or port visits without any harassment from Russian forces, but this was the first visit after it was outfitted with BMD capabilities, a source of significant threat perceptions for Moscow.\textsuperscript{20} It is plausible that Moscow was seeking to dissuade BMD-capable ships from operating near its shores in the future.

Russia’s more aggressive behavior in the 2016, meanwhile—as demonstrated by the U.S. commanding officer’s decision to pause the exercises after a Su-24 passed close to the *Cook* on April 11 and to declare the April 12 encounters with Su-24s as unsafe—suggests that it was attempting to disrupt the *Cook*’s ongoing activities, a case of tactical compellence (H1a). Perhaps the more proximate location to the Russian Baltic Sea fleet base was the trigger in this case or the very fact of engaging in a naval exercise; in 2014, the *Cook* was not conducting an exercise.

H2 (deterring future actions) seems less likely because Russia’s signaling efforts in both the Black and Baltic Seas were in response to U.S. precipitating actions. If this hypothesis were true, we would not have seen a precipitating U.S. action. Given that we have identified a specific Russian political-military objective—to either compel an alteration in the *Cook*’s activities or future U.S. deployments—it is unlikely that Russia was signaling its discontent with the status quo generally (H3). Putin’s assertions that the local commanders were acting on their own could be evidence in favor of AH1. But the very repetition of coercive signaling toward the *Cook*—using multiple passes and multiple platforms during incidents that occurred two years apart—contradicts his assertions. Finally, it is also unlikely that Russia sought to provoke a U.S. military response to collect intelligence (AH4) because none of the plausible U.S. responses were useful to Moscow for better understanding U.S. military capabilities or procedures. See Table 5.1 for a summary.

\textsuperscript{20} U.S. Carriers, “USS Donald Cook DDG 75 History,” webpage, last updated July 18, 2021.
Understanding Russian Coercive Signaling

Surface-Surface

Case Description

On June 7, 2019, a Russian destroyer, the Admiral Vinogradov, came within 50–100 feet of the USS Chancellorsville, a Ticonderoga-class guided-missile cruiser in the western Pacific. The Chancellorsville was deployed to the Pacific after undergoing modernization with an Aegis Baseline 9 Combat System, the first forward deployment of its kind to an overseas home

<table>
<thead>
<tr>
<th>Hypothesis</th>
<th>Assessment</th>
<th>Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td>H1a: Tactical compellence: compel a change to ongoing military action.</td>
<td>Likely (2016)</td>
<td>Russia’s signaling might have been intended to compel a specific political-military objective: Interfere with the Cook’s operations and the broader exercise.</td>
</tr>
<tr>
<td>H1b: Operational compellence: Compel a change in a pattern of behavior, usually to dissuade further action.</td>
<td>Likely (2014)</td>
<td>Likely aimed at signaling to the United States that Russia does not want future Aegis-capable ships operating in the Black Sea.</td>
</tr>
<tr>
<td>H2: Deter possible adversary aggression.</td>
<td>Unlikely</td>
<td>Russian actions were conducted in response to U.S. precipitating action.</td>
</tr>
<tr>
<td>H3: Status signaling: Force an adversary to acknowledge Russia’s status.</td>
<td>Unlikely</td>
<td>Specific political-military objective identified.</td>
</tr>
<tr>
<td>AH1: Russian pilots or captains are acting unprofessionally or making decisions without authorization.</td>
<td>Unlikely</td>
<td>Repeated signals across various platforms suggest a purposeful strategy rather than rogue decisionmaking by lower-level Russian military officers.</td>
</tr>
<tr>
<td>AH4: Russia is seeking to provoke a U.S. military response to gather better intelligence on U.S. capabilities, CONOPs, or readiness.</td>
<td>Unlikely</td>
<td>No plausible U.S. response would have been relevant to Russian collection.</td>
</tr>
</tbody>
</table>
The U.S. 7th Fleet reported that the Chancellorsville was attempting to recover a helicopter when the Admiral Vinogradov “maneuvered from behind and to the right of Chancellorsville, accelerated and closed to an unsafe distance,” forcing the Chancellorsville to conduct emergency maneuvers to prevent a collision. During the recovery operation, the ship had limited mobility and would have signaled as much to passing vessels, both using radio calls (including as specified in INCSEA) and by putting up flags on the mast indicating that the ship is restricted in its ability to move. The U.S. Navy reported that the incident occurred in the Philippine Sea. In response, then–Acting Secretary of Defense Patrick Shanahan said, “we’ll have military-to-military conversations with the Russians, and of course we’ll demarche them.”

Russian sources, however, claimed that the Chancellorsville caused the incident. The press service of Russia’s Pacific Fleet stated that

the US cruiser Chancellorsville suddenly changed its course and crossed the Admiral Vinogradov destroyer’s course some 50 meters away from the ship. In order to prevent a collision, the Admiral Vinogradov’s crew was forced to conduct an emergency maneuver.

However, video footage of the incident taken from the Chancellorsville shows Russian sailors sunbathing on the deck of the Vinogradov during the incident (see Figure 5.3). When interviewed by Russian media, a former

---

chief of staff of the Russian Navy observed that the sailors were relaxing and noted “there is a time for war, and a time for sunbathing.”

A similar incident occurred in the North Arabian Sea on January 9, 2020, between the USS *Farragut*, a destroyer, and the *Ivan Khurs*, an advanced Russian reconnaissance ship. At the time, the *Farragut* had been deployed as part of the Harry S. Truman Carrier Strike Group’s nine-month tour supporting the U.S. 2nd, 4th, 5th, and 6th Fleets. At the time when this incident occurred, according to U.S. Second Fleet Public Affairs, the *Farragut* was supporting “Coalition Task Force (CTF) Sentinel, ensuring safe passage of commercial shipping in international waters throughout the Arabian Gulf, Strait of Hormuz, the Bab el-Mandeb Strait and the Gulf of Oman.”

According to the U.S. Navy, the *Khurs* approached the *Farragut* “aggressively” while the *Farragut* conducted routine operations. The *Farragut*

---


“sounded five short blasts, the international maritime signal for danger of a collision, and requested the Russian ship alter course in accordance with international rules of the road.” Although the Russian ship did not comply initially, it changed course before a collision could occur.28 Meanwhile, the Russian Ministry of Defense countered that the Farragut had acted unprofessionally, claiming that the Khurs was to the left of the Farragut and therefore needed to give way to the Khurs under international rules.29

Case Assessment

Russia’s actions toward both the USS Chancellorsville and USS Farragut are best explained by H3 (status signaling) or AH1 (unauthorized behavior). We cannot identify a specific military or political-military objective Russia was pursuing in either case. Neither U.S. ship was engaged in activities that could threaten Russian forces. The actions occurred far from the Russian homeland; Russian interests were not threatened in any way by the U.S. activity. Although the Khurs’s actions were problematic for the Farragut, they did not alter the operations of the U.S. ship. And it does not seem plausible that the Khurs’s actions were meant to dissuade future U.S. operations in the North Arabian Sea. Therefore, neither H1a, tactical compellence, nor H1b, operational compellence, are supported by the evidence in either case because we cannot identify a desired tactical or operational change that Moscow was seeking. H2 does not fit because there was a precipitating U.S. action for both events.

The clear lack of deliberate brinksmanship, particularly in the Vinogradov incident, is suggestive of a status-signaling effort, as described in H3. The Chancellorsville was effectively immobilized for the recovery operation, so the Russian ship captain did not have to anticipate its reactions to the maneuver. He would have ordered his sunbathing sailors off the deck if he had thought there was a true danger of a collision. This incident therefore


could have been a case of using an encounter at sea to demonstrate Russia’s discontent with broader U.S. attitudes.

In the case of the *Farragut* and the *Khurs*, there were regional geopolitical dynamics in play at the time: The incident occurred six days after the U.S. strike that killed the Iranian commander of the Quds Force, General Qasem Soleimani, and one day after Iran launched ballistic missiles on U.S. forces at the al-Asad airbase in Iraq in retaliation. It is possible that the move was meant to signal Russian dissatisfaction with the U.S. strike.

Russian behavior in the two incidents could also be consistent with AH1, which posits that local commanders are acting on their own accord. Ship captains in the U.S. Navy tend to be given a high degree of autonomy when they are at sea, particularly far away from U.S. shores. Perhaps their Russian counterparts do as well. In fact, in examining these cases, it becomes clear that actions consistent with status signaling (H3) are also likely to be consistent with unauthorized actions (AH1). Both describe actions that lack a concrete military or political-military objective. Perhaps the only means of distinguishing between the two is if we had evidence pointing to standing orders to commanders to confront U.S. ships when the opportunity presents itself.

We can likely reject H1a (tactical compellence) because, as discussed, both U.S. ships were operating in areas far away from Russia and not engaging in any military activities that seem particularly problematic to Russia. If tactical compellence did explain Russian behavior in this case, we would expect to see one or both of those conditions met. Similarly, it does not appear that either ship was engaged in a pattern of behavior that Russia sought to change, allowing us to reject H1b (operational compellence). H2 (deterrence) does not apply in this case because we cannot identify how these incidents could have contained a deterrent message. We assess AH4 to be unlikely to explain Russian actions in either incident because neither seemed designed to elicit a particular military response that deviated from normal collision-avoidance actions that could be relevant for intelligence collection. The *Farragut* incident shows this very clearly because that incident occurred during a period of heightened U.S.-Iran tensions in January 2020, when Russia presumably would be interested in closely monitoring the activities of a carrier strike group in the North Arabian Sea. Rather than using its AGI ship to shadow and collect on U.S. assets to provide warn-
ing to Moscow, according to available information, Russia instead used its AGI ship in a manner inconsistent with an intelligence-gathering mission by coming in so close and aggressively.

It is interesting to note that the location of these surface-surface incidents—far away from Russian shores, and even distant from naval theaters, such as the Mediterranean, where the Russian Navy has traditionally been active—is not an aberration. Indeed, there are no surface-surface incidents in the Black and Baltic Seas in our data set. Although it would be physically impossible for air-surface incidents to occur beyond the range of Russian fighters stationed at airbases, the Russian Navy could certainly engage U.S. or allied naval vessels near Russian shores. Several of the most notable Cold War–era incidents were surface-surface cases near the Soviet Union, such as the ramming of the U.S. Navy ships in the Black Sea in 1988. But, at least since 2010, it is the VKS that engages U.S. and allied naval vessels along Russia’s periphery. See Table 5.2 for a summary.

Air-Air

Case Description

In August 2020, the United States and its NATO allies conducted the Allied Sky exercise. As part of the exercise, U.S. B-52 Stratofortress bombers flew over all 30 member states. NATO Secretary General Jens Stoltenberg explained that the purpose of such exercises was to “help ensure that [NATO fulfills its] core mission: to deter aggression, prevent conflict, and preserve peace.”30 In this section, we examine two separate incidents that occurred on the same day, August 28, 2020, when Russian Su-27 fighters intercepted B-52s over the Black and Baltic Seas.31 We look at these two incidents together because they control for a number of key variables: the airframes involved on both sides (Su-27s and B-52s); the activities being conducted by the aircraft; and the geopolitical, domestic political, and other

---


Understanding Russian Coercive Signaling

While conducting what the USAF called “routine operations” in international waters in the Black Sea as part of the Allied Sky exercise, a B-52 was intercepted by two Su-27s as it flew toward the Crimean Peninsula and the Russian mainland coast. It is rare for U.S. bombers to fly so close to Russian territory, particularly approaching national airspace. The USAF described the intercept as “unsafe and unprofessional” as the Russian jets

---

**TABLE 5.2**

**Hypothesis Testing: Surface-Surface Incidents**

<table>
<thead>
<tr>
<th>Hypothesis</th>
<th>Assessment</th>
<th>Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td>H1a: Tactical compellence: compel a change to ongoing military action</td>
<td>Unlikely</td>
<td>U.S. vessels were not engaged in ongoing military action problematic to Russia or that Russia sought to alter and were geographically distant from core Russian interests.</td>
</tr>
<tr>
<td>H1b: Operational compellence: Compel a change in a pattern of behavior, usually to dissuade further action.</td>
<td>Unlikely</td>
<td>The United States was not engaged in a pattern of behavior that Russia sought to change.</td>
</tr>
<tr>
<td>H2: Deter possible adversary aggression.</td>
<td>Unlikely</td>
<td>U.S. precipitating action occurred, whereas this hypothesis is concerned with cases when Russia initiated an action.</td>
</tr>
<tr>
<td>H3: Status signaling: Force an adversary to acknowledge Russia’s status.</td>
<td>Likely</td>
<td>There was no specific political-military objective, and it was far from the Russian homeland and immediate periphery.</td>
</tr>
<tr>
<td>AH1: Russian pilots or captains are acting unprofessionally or making decisions without authorization.</td>
<td>Likely</td>
<td>There was no apparent military objective. There was no evidence of brinksmanship.</td>
</tr>
<tr>
<td>AH4: Russia is seeking to provoke a U.S. military response to gather better intelligence on U.S. capabilities, CONOPs, or readiness.</td>
<td>Unlikely</td>
<td>No plausible response would have been relevant for collection.</td>
</tr>
</tbody>
</table>
crossed “within 100 feet of the nose of the B-52 multiple times at co-altitude and while in afterburner causing turbulence and restricting the B-52’s ability to maneuver.”

Cockpit footage released by the USAF shows one of the Su-27s flying closely to the B-52 as it crossed from left to right, creating turbulence in the processes (see still photos in Figures 5.4 and 5.5). The Russian government, meanwhile, claimed that the jets were scrambled to prevent a violation of Russia’s airspace. According to the Russian National Defense Control Center, the jets remained at a safe distance and followed international law.

An audio recording of what appears to be the chatter between the Russian Su-27s and their ground controllers, posted to YouTube several days after the event, provides clear evidence of Russian tactical compellence. Although the authenticity of the recording cannot be demonstrated conclusively, there is evidence from the chatter that matches what we know about the incident. The pilots mention a tail number of the airframe they are intercepting, MT 034, which corresponds to a tail number visible in Russian video footage of the incident released on August 28. The pilots in the recording also note the presence of an RC-135 reconnaissance aircraft in addition to the B-52; an RC-135 was indeed in the vicinity of the incident, according to online flight trackers (see Figure 5.6).

In the recording, the pilots receive orders to intercept the B-52 and “push it” to a different course (and away from the Russian coast). The ground

---


FIGURE 5.4
Russian Su-27 Approaching U.S. B-52 in the Black Sea


FIGURE 5.5
Russian Su-27 Flying Across the Nose of a U.S. B-52

controller instructs the Russian pilots to force the B-52 to turn around: “The task is to come closer, following safety guidelines, identify the type of airplane, country, and, if possible, do not let it further into Black Sea waters. Change the course of the target to 180.” This guidance is consistent with the Russian concept of *prinuzhdienie* described in Chapter Three. The controller repeats, “The task is: One of you stands in front, the other one stands behind. Try to push [it] in the opposite direction or on the course 180.” The Su-27 pilots make an initial attempt to implement the command but the B-52 does not change course. “We fulfilled the task, but it does not follow

FIGURE 5.6
Flight Tracking Map Showing U.S. B-52 Flight Path

the orders,” they report. One pilot tells the other to rock his wings as another signal to the B-52. When that does not work, the pilots ask ground control if they should initiate a radar lock, a highly aggressive move, and are told not to do so. “Try to push [it] off course,” the ground controller insists, telling the pilots to continue following the B-52. “It does not follow orders, it does not react to maneuvers,” the pilots reply. After discussing what seems to be the maneuver captured in the U.S. video, the pilots report back to ground control that they succeeded in pushing the B-52 off course. The dialogue implies that Russia sees escalatory gradations in the tactics it uses to compel an asset to change course: wing dips to show weapons, using the afterburner to create turbulence while passing in front, and radar target locks.

Later that day, a Russian Su-27 intercepted a different U.S. B-52 in international airspace over the Baltic Sea. The intercept occurred as the bomber was approaching Danish airspace near Bornholm Island. The Russian Su-27, which had taken off from Kaliningrad, followed the B-52 “well into” Danish airspace over the island, according to NATO Allied Air Command (see Figure 5.7). The command stated that the intrusion was a “significant violation of international law” and “the first of its kind for several years and indicates a new level of Russian provocative behavior.”38 The Royal Danish Air Force scrambled Quick Reaction Alert F-16 aircraft in response, but by the time they arrived in the area, the Russian Su-27 had left Danish airspace.39 The Russian Ministry of Defense published its own version of events, saying that the Su-27 remained in neutral waters and did not cross into Danish airspace.40

**Case Assessment**

The Russian cockpit chatter recording represents something of a smoking gun, indicating that tactical compellence (H1a) provides the best explana-

---


For whatever reason, Russia appears to have concluded that the U.S. B-52’s flight path was unacceptably close to Russian airspace, and therefore the pilots were ordered to force it to change course. The recording suggests that the pilots’ movements were tightly managed by the ground controllers, who ordered them to compel a change in the U.S. bomber’s flight path.

By contrast, the incident over the Baltic Sea was inconsistent with tactical compellence (H1a). According to NATO’s account, the intercept was routine until the airspace violation, and that violation was not an attempt to alter the ongoing mission of the bomber. Operational compellence (H1b), however, does seem to fit. Russia might have been attempting to signal to the United States that bomber flights to the Baltic Sea in the future would risk receiving a similar escalatory Russian response. The violation was non-trivial (“well into” Danish airspace), and its location was abnormal (unlike
relatively regular Russian violations of Estonian airspace over an uninhabited island in the Baltic Sea during the so-called Kaliningrad milk run).

Given that Russia was responding to a precipitating U.S. action, and we have identified a plausible Russian political-military objective (i.e., prevent a potential violation of Russian airspace by the United States), we find that deterrence and status signaling (H2 and H3, respectively) are unlikely explanations for either incident. We similarly reject AH4 as an explanation because Russian actions suggest that Russia was attempting to compel a change in U.S. behavior, not provoke a specific U.S./NATO response. The Russian Su-27 did not even stay near Danish airspace long enough to observe the intercept. Finally, AH1 can probably be rejected for both incidents. The recording of the Black Sea incident indicates that the pilots were ordered to push the U.S. aircraft off course. Although they had a degree of autonomy in the exact method for implementing the command, they were following clear orders. We lack a similar smoking gun for the Baltic Sea incident, but the rarity and significance of the violation suggests that the Su-27 pilot was not acting on a whim. (See Table 5.3 for a summary.)

Conclusion

The cases—air-surface, surface-surface, and air-air—that are described in this chapter demonstrate the variety of tactics that Russia uses in its coercive signaling efforts. Given the limited number of cases analyzed, we cannot necessarily draw broad generalizations about Russian signaling behavior. However, we do see that air-surface cases are almost by definition compellence of one sort or another (H1a, H1b, or, in theory, H1c, although we cannot test for it using case studies). The same can be said of air-air cases, or, more specifically, assertive Russian intercepts of U.S. or allied aircraft because our air-air cases do not include U.S. intercepts of Russian aircraft. In other words, assertive Russian intercepts likely are compellent signals related either to the specific activities of a given aircraft (as in the B-52 in the Black Sea) or a broader pattern of U.S. or allied aerial behavior. By contrast, the surface-surface cases are unlikely to be compellence or deterrence; assuming they continue to occur far away from Russian shores, status signaling or unauthorized behavior seem to be more-likely explanations.
Beyond serving as illustrative examples of how Russia could act when behaving in ways that our hypotheses predict, however, some features of the cases considered here do potentially offer insight into Russia’s signaling strategy, particularly in incidents of a similar type. First, as discussed previously, Russia has seemed to rely solely on air assets for signaling efforts in the Black and Baltic Seas for approximately the last decade, even when

<table>
<thead>
<tr>
<th>Hypothesis</th>
<th>Assessment</th>
<th>Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td>H1a: Tactical compellence: compel a change to ongoing military action.</td>
<td>Likely (Black Sea case)</td>
<td>The Russian intercept appears to have been intended to alter the B-52’s flight path, pushing it away from Russian territory.</td>
</tr>
<tr>
<td>H1b: Operational compellence: Compel a change in a pattern of behavior, usually to dissuade further action.</td>
<td>Likely (Baltic Sea case)</td>
<td>By following the U.S. B-52 into Danish airspace, Russia might have been attempting to signal not to send bomber flights to that region in the future.</td>
</tr>
<tr>
<td>H2: Deter possible adversary aggression.</td>
<td>Unlikely</td>
<td>The U.S. precipitating action occurred, whereas this hypothesis is concerned with cases when Russia initiates an action.</td>
</tr>
<tr>
<td>H3: Status signaling: Force an adversary to acknowledge Russia's status.</td>
<td>Unlikely</td>
<td>A specific political-military activity was identified.</td>
</tr>
<tr>
<td>AH1: Russian pilots or captains are acting unprofessionally or making decisions without authorization.</td>
<td>Unlikely</td>
<td>The recording of the Black Sea incident suggests that the intercept was authorized; the depth at which the Su-27 violated Danish air space suggests that the signal was purposeful.</td>
</tr>
<tr>
<td>AH4: Provoke a U.S. military response to gather better intelligence on U.S. capabilities, CONOPs, or readiness.</td>
<td>Unlikely</td>
<td>Russian actions are more consistent with compelling a change in U.S. behavior.</td>
</tr>
</tbody>
</table>
Second, in cases in which there is no plausible military objective, the motive of Russian signaling behavior is harder to determine. As we saw, H3 (status signaling) and AH1 (unauthorized behavior) seem difficult to distinguish in these cases. Finally, and related to the previous point, the location where Russia sends a signal seems to matter in terms of brinksmanship or assertive behavior. Where Russia sees core interests potentially under threat, it might pursue more-assertive and potentially dangerous signaling efforts. In scenarios far from the Russian homeland that do not pose an immediate threat, Russian forces may engage in less risky signaling efforts.
CHAPTER SIX

Conclusion

This report uses a variety of analytical tools to better understand Russian coercive signaling. We leveraged IR scholarship and history to develop hypotheses regarding the drivers of Russian behavior. We then assessed these hypotheses using three analytical cuts: searching for related or supportive concepts in Russian strategic thought, evaluating an original data set of Russian coercive signaling incidents, and examining several of these incidents through detailed case studies. Our primary research findings are presented in the following sections.

Findings

Table 6.1 presents our hypotheses and summarizes the findings from the three analytical approaches, indicating the strength of the supporting evidence we found and the source of that support.

As a general matter, we found solid empirical grounds to make judgments about Russia’s motives. Russian strategy calls for activities consistent with tactical compellence, operational compellence, coercive diplomacy, and deterrence. Russian military strategists have developed an all-encompassing concept of strategic sderzhivanie (causing the adversary to act with restraint), which rationalizes a wide range of actions to coerce an adversary to demonstrate restraint. That coercion can come in the form of H1b-like compellence and H2-type deterrence. The operational concepts of sderzhivayushchie deistviya (actions to cause restraint) and demonstratsionnye deistviya (demonstrational actions) indicate that the military thinks in the terms of H1b and H2 objectives and links compellence with diplomatic processes consistent with H1c. The tactical use of the term prinuzhdenie (in this context,
TABLE 6.1

Findings Summary

<table>
<thead>
<tr>
<th>Hypothesis</th>
<th>Description</th>
<th>Findings</th>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>H1a</td>
<td>Tactical compellence: Compel a change to ongoing military action.</td>
<td>Strong support</td>
<td>Strategy, case studies</td>
</tr>
<tr>
<td>H1b</td>
<td>Operational compellence: Compel a change in a pattern of behavior, usually to dissuade further action.</td>
<td>Strong support</td>
<td>Strategy, quantitative analysis, case studies</td>
</tr>
<tr>
<td>H1c</td>
<td>Coercive diplomacy: Force a negotiation related to the ongoing activity.</td>
<td>Moderate support</td>
<td>Strategy, quantitative analysis</td>
</tr>
<tr>
<td>H2</td>
<td>Deter possible adversary aggression.</td>
<td>Strong support</td>
<td>Strategy, quantitative analysis</td>
</tr>
<tr>
<td>H3</td>
<td>Status signaling: Force an adversary to acknowledge Russia’s status.</td>
<td>Moderate support</td>
<td>Quantitative analysis (no support), case studies (moderate support)</td>
</tr>
<tr>
<td>AH1</td>
<td>Russian pilots or captains are acting unprofessionally, or making decisions without authorization.</td>
<td>Moderate support</td>
<td>Quantitative analysis (no support), case studies (moderate support)</td>
</tr>
<tr>
<td>AH2</td>
<td>Any increase in incidents is purely a function of the revival in Russia’s military capabilities.</td>
<td>No support*</td>
<td>Quantitative analysis</td>
</tr>
<tr>
<td>AH3</td>
<td>These incidents are artificial attempts to stoke tensions with the West to create a rally-around-the-flag effect and bolster Putin’s ratings.</td>
<td>No support</td>
<td>Quantitative analysis</td>
</tr>
<tr>
<td>AH4</td>
<td>Provoke a U.S. military response to gather better intelligence on U.S. capabilities, CONOPs, or readiness.</td>
<td>No support</td>
<td>Case studies</td>
</tr>
</tbody>
</table>

NOTE: *There was one statistical test that showed some support, but it was not substantively significant.

compellence) suggests that standing instructions to use coercive signaling as a means of compelling an adversary’s military forces to change an ongoing
behavior do exist (H1a) and can be carried out when circumstances demand. Russian portrayals of U.S. activities suggest that Moscow expects H2-type deterrence signaling to follow regular, predictable patterns.

The quantitative analysis strongly supports operational compellence and deterrence and provides some support for coercive diplomacy. Drawing on the results of dozens of statistical tests, we found by far the most-consistent support for H1b, i.e., that Russian forces are acting in a manner aimed at compelling a change in patterns of specific U.S. and allied behavior. Russian assertive incidents occurred in the same domains and geographic regions as patterns of U.S. and allied behavior that Moscow finds objectionable. Russia’s actions tend to be symmetrical responses narrowly tailored to affect the patterns that it seeks to change. Specifically, the data show that as the number of U.S. ISR and bomber flights in Europe increases, so do the expected number of assertive Russian incidents in the air. The average number of assertive Russian maritime incidents in the Black or Baltic Seas in a given month is seven times higher when a U.S. Aegis-capable ship is present in those areas. When NATO conducted exercises in countries bordering Russia, there was a threefold increase in the average number of assertive Russian snap exercises, defined as those that took place in regions on the country’s western borders. Although there is a paucity of evidence to generate robust findings in support of coercive diplomacy, H1c, the evidence that we do have is suggestive of a connection between coercive signaling and diplomatic overtures.

Our expectations for behavior consistent with deterrence (H2) were also borne out in statistical testing. Classic deterrence activities—LRA flights and routine exercises—should remain steady over time if they are not being used for more-pointed geopolitical or military signaling. And, indeed, that expectation is borne out in the data. Specifically, the continuity pre- and post-2014 suggests that Russia did not use these activities to signal greater discontent with Western policies, for example, on sanctions. This stability over time is consistent with a general deterrence message, which was equally relevant before relations worsened that year.

The statistical results do not provide empirical support for status signaling (H3) because cross-domain and all-domain linkages are largely absent. The patterns we do identify in support of operational compellence (H1b) contradict the unauthorized behavior hypothesis (AH1) or at least
systematic unauthorized behavior because they are not random. In the air domain, if assertive incidents were the product of individual pilots’ decisions, we would expect to see a decline in the rate of U.S. flights encountering assertive Russian activity. What we see is the opposite—a close connection between U.S. activity and Russian assertiveness. The modeling also does not bear out robust linkages with Russian military capacity improvements (AH2). For example, a steady increase in pilot flight hours over the past decade, which we treat as a proxy for capability, appeared to have no statistically meaningful relationship with air-air assertive signaling. Finally, the statistical analysis provides some evidence to contradict rally-around-the-flag motivations (AH3): We saw that increases in Putin’s approval rating are associated with a greater number of assertive incidents in the following month. We would have expected to see more such incidents follow a decline in his rating if they were being used to “wag the dog.”

The case studies demonstrated clear-cut evidence of tactical (H1a) and operational (H1b) compellence and more-ambiguous findings about status signaling (H3). The air-surface cases that we examined, both relating to Russian aerial signaling of the same U.S. surface ship (in different seas and with a two-year time lag), were both cases of compellence. However, in one instance, the Russian actions were not plausibly intended to disrupt the ship’s operations—and thus were more likely an attempt to compel a change in future behavior (H1b)—whereas the Russian activity was disruptive to the ship’s activities in the other case (H1a). The same can be said of the two air-air cases, which were assertive Russian intercepts of the same U.S. aircraft type on the same day. In one case, we can say almost for certain that the Russian pilots had orders to disrupt the U.S. flight to cause it to change course (tactical compellence, H1a); in the second case, there was no such attempt (operational compellence, H1b). By contrast, the surface-surface cases, which occurred far away from Russian shores, were not responding to any particular U.S. activity. Status signaling (H3) or unauthorized behavior (AH1) seem to be more likely explanations. We did not see any signs of intelligence collection–based provocations (AH4) in the cases.

It should be noted that the nature of the findings of the analysis of Russian strategic writings differs from that of the findings of the quantitative and qualitative evaluations. Whereas the latter can both buttress and undermine the validity of the hypotheses, Russian strategy can only show sup-
port; the absence of evidence for a hypothesis in Russian thinking is not dispositive. Moreover, the support such evidence provides differs as well; it can confirm that Russian strategists think in similar terms but does not necessarily speak to the drivers of particular Russian actions.

Implications

The following implications emerge from our analysis.

- **Much of the assertive, dangerous, or unsafe Russian activity appears directed at shaping patterns of ongoing U.S. or allied behavior.** Such activity is almost by definition responsive, not proactive. Moscow appears to be using coercive signals to send targeted compellent messages regarding activities that it finds problematic. It should be emphasized that this is an empirical research finding; it is neither a normative assessment nor a policy prescription.

- **These compellent signals are often linked to particular U.S. and allied activities.**
  - U.S. or NATO exercises held in states that border Russia produce a statistically significant increase in Russian snap exercises on the country’s western frontiers.
  - The average number of Russian assertive maritime incidents in the Black or Baltic Seas in a given month is seven times higher when an Aegis-capable U.S. ship is present in those areas.

- **Most proactive activities (LRA flights, routine exercises) are generally used for broad deterrence messaging and do not pose immediate safety concerns.** Russia’s deterrent signaling appears to be deliberately predictable.

- **There is thus a line between the Russian practices of compellence and deterrence that emerges from our study.** Compellent signals are usually a response to U.S. or allied behavior that Moscow finds problematic, generally along Russia’s periphery; these signals can be quite belligerent. Deterrent signals are generally predictable and do not entail brinkmanship.
• The Russian Navy appears to be engaged only in signaling beyond Russia’s immediate periphery. It is difficult to identify concrete military objectives behind this activity. It might be status signaling, but captains acting without authorization is equally plausible explanation.

The evidence and analysis presented in this report also offer important insights that can help U.S. efforts to interpret future Russian coercive signaling activities. Figures 6.1 through 6.4 provide guides to evaluate such activities, drawn from the findings of this report.

This guide is a first attempt at operationalizing our analysis. Future research might lead to revisions or enhancements. But if past patterns hold, these could be useful empirically grounded tools for understanding Russia’s coercive signaling activities.

**FIGURE 6.1**
Interpreting Russian Coercive Signals: Ground Exercises

- Located near Russian border with United States or allies
- Not located near Russian border with United States or allies
- Russian military exercise
- Previously scheduled or announced exercise
- Snap exercise
- Deterrence (H2)
- Operational compellence (H1b)
FIGURE 6.2
Interpreting Russian Coercive Signals: U.S. or Allied Intercept of Russian Aircraft

U.S. or allied aircraft intercept Russian aircraft

Tactical aviation (non-LRA)

Non-assertive

Assertive

SPB-Kaliningrad Milk Run

Other location

Not a coercive signal

Status signaling (H3)

Deterrence (H2)

Abnormal flight path

Normal flight path

LRA

NOTE: SPB = St. Petersburg.

FIGURE 6.3
Interpreting Russian Coercive Signals: Russian Intercept of U.S. or Allied Aircraft

Russian aircraft intercepts U.S. or allied aircraft

Non-assertive

Not a coercive signal

Assertive

Operationally disruptive

Coercive diplomacy (H1c)

Tactical compellence (H1a)

Recent related diplomatic initiative

Recent related diplomatic initiative

No recent related diplomatic initiative

Operational compellence (H1b)
FIGURE 6.4
Interpreting Russian Coercive Signals: Maritime Incidents

Air-surface

Operationally disruptive

No recent related diplomatic initiative

Tactical compellence (H1a)

Recent related diplomatic initiative

Coercive diplomacy (H1c)

Not operationally disruptive

No recent related diplomatic initiative

Operational compellence (H1b)

Surface-surface

In Black Sea, Baltic Sea, Barents Sea, or near Pacific coast?

Yes

No

Status signaling (H3)

Unprofessional or unauthorized behavior

(No data)
### APPENDIX

**Additional Statistical Data**

**TABLE A.1**  
**Classification of Force Sizes**

<table>
<thead>
<tr>
<th>Size of Force</th>
<th>Air</th>
<th>Sea</th>
<th>Land</th>
</tr>
</thead>
</table>
| Small        | Three or fewer fighters, transport, intel, or unspecified  
              | Single bomber                          | Single small surface vessel (frigates and smaller or unspecified)  
              | Single attack submarine                | Company or smaller            |
| Medium       | Four fighters, transport, intel, or unspecified, through squadron size  
              | Two bombers                            | Single large surface vessel (destroyer or higher)  
              | Several small surface vessels (frigates and smaller or unspecified)  
              | Multiple attack submarines  
              | Single ballistic missile submarine    | Battalion, regiment, or brigade size |
| Large        | Above squadron size—fighters, transport, intel, or unspecified  
              | Three or more bombers                  | Multiple large surface vessels (destroyer or higher)  
              | Single aircraft carrier  
              | Multiple ballistic missile submarines | More than brigade size          |
### TABLE A.2
**Russian Assertive Sea Incidents and U.S. Naval Activity**

<table>
<thead>
<tr>
<th>Possible Driver of Activity</th>
<th>All Assertive Sea (Black/Baltic)</th>
<th>Low-Level Assertive Sea (Black/Baltic)</th>
</tr>
</thead>
<tbody>
<tr>
<td>U.S. presence in Black/Baltic</td>
<td>0.780** (–0.291)</td>
<td>0.780** (–0.291)</td>
</tr>
<tr>
<td>Crude oil price</td>
<td>-0.043 (–0.0371)</td>
<td>-0.043 (–0.0371)</td>
</tr>
<tr>
<td>Putin’s approval rating</td>
<td>-0.0971 (–0.0869)</td>
<td>-0.0971 (–0.0869)</td>
</tr>
<tr>
<td>Defense spending as percentage of GDP</td>
<td>99.56 (–68.99)</td>
<td>99.56 (–68.99)</td>
</tr>
<tr>
<td>Tactical flight hours</td>
<td>-0.00727 (–0.0449)</td>
<td>-0.00727 (–0.0449)</td>
</tr>
<tr>
<td>Constant</td>
<td>6.177</td>
<td>6.177</td>
</tr>
<tr>
<td>Observations</td>
<td>99</td>
<td>99</td>
</tr>
</tbody>
</table>

**NOTE:** Standard errors in parentheses. **p < 0.01.
### TABLE A.3
**Russian Assertive Sea Incidents and U.S. Aegis Presence**

<table>
<thead>
<tr>
<th>Possible Driver of Behavior</th>
<th>All Assertive Sea (Black/Baltic)</th>
<th>Low-Level Assertive Sea (Black/Baltic)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aegis presence</td>
<td>0.970*</td>
<td>0.970*</td>
</tr>
<tr>
<td></td>
<td>(–0.392)</td>
<td>(–0.392)</td>
</tr>
<tr>
<td>Crude oil price</td>
<td>–0.0484</td>
<td>–0.0484</td>
</tr>
<tr>
<td></td>
<td>(–0.0361)</td>
<td>(–0.0361)</td>
</tr>
<tr>
<td>Putin’s approval rating</td>
<td>–0.136</td>
<td>–0.136</td>
</tr>
<tr>
<td></td>
<td>(–0.0866)</td>
<td>(–0.0866)</td>
</tr>
<tr>
<td>Defense spending as percentage of GDP</td>
<td>105.3</td>
<td>105.3</td>
</tr>
<tr>
<td></td>
<td>(–70.75)</td>
<td>(–70.75)</td>
</tr>
<tr>
<td>Tactical flight hours</td>
<td>–0.00408</td>
<td>–0.00408</td>
</tr>
<tr>
<td></td>
<td>(–0.0468)</td>
<td>(–0.0468)</td>
</tr>
<tr>
<td>Constant</td>
<td>8.951</td>
<td>8.951</td>
</tr>
<tr>
<td></td>
<td>(–12.67)</td>
<td>(–12.67)</td>
</tr>
<tr>
<td>Observations</td>
<td>99</td>
<td>99</td>
</tr>
</tbody>
</table>

**NOTE:** Standard errors in parentheses. * \( p < 0.05 \).
<table>
<thead>
<tr>
<th>Possible Driver of Behavior</th>
<th>All Assertive Sea (Black/Baltic)</th>
<th>Low-Level Assertive Sea (Black/Baltic)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of U.S. ships</td>
<td>0.444*</td>
<td>0.444*</td>
</tr>
<tr>
<td></td>
<td>(–0.182)</td>
<td>(–0.182)</td>
</tr>
<tr>
<td>Crude oil price</td>
<td>–0.0495</td>
<td>–0.0495</td>
</tr>
<tr>
<td></td>
<td>(–0.0348)</td>
<td>(–0.0348)</td>
</tr>
<tr>
<td>Putin’s approval rating</td>
<td>–0.108</td>
<td>–0.108</td>
</tr>
<tr>
<td></td>
<td>(–0.0807)</td>
<td>(–0.0807)</td>
</tr>
<tr>
<td>Defense spending as a percentage of GDP</td>
<td>102.6</td>
<td>102.6</td>
</tr>
<tr>
<td></td>
<td>(–72.49)</td>
<td>(–72.49)</td>
</tr>
<tr>
<td>tactical flight hours</td>
<td>–0.000664</td>
<td>–0.000664</td>
</tr>
<tr>
<td></td>
<td>(–0.0425)</td>
<td>(–0.0425)</td>
</tr>
<tr>
<td>Constant</td>
<td>6.86</td>
<td>6.86</td>
</tr>
<tr>
<td></td>
<td>(–11.45)</td>
<td>(–11.45)</td>
</tr>
<tr>
<td>Observations</td>
<td>99</td>
<td>99</td>
</tr>
</tbody>
</table>

NOTE: Standard errors in parentheses. * p < 0.05.
### TABLE A.5
**Russian Exercises and Green or Blue Exercises**

<table>
<thead>
<tr>
<th>Possible Driver of Behavior</th>
<th>Russian Snap Exercises</th>
<th>Russian Assertive Snap Exercises</th>
</tr>
</thead>
<tbody>
<tr>
<td>All blue/green land exercises</td>
<td>0.135</td>
<td>0.183</td>
</tr>
<tr>
<td></td>
<td>(–0.162)</td>
<td>(–0.229)</td>
</tr>
<tr>
<td>Crude oil price</td>
<td>0.0168</td>
<td>0.00695</td>
</tr>
<tr>
<td></td>
<td>(–0.0111)</td>
<td>(–0.0173)</td>
</tr>
<tr>
<td>Putin’s approval rating</td>
<td>0.00213</td>
<td>0.0231</td>
</tr>
<tr>
<td></td>
<td>(–0.0308)</td>
<td>(–0.0493)</td>
</tr>
<tr>
<td>Defense spending as a percentage of GDP</td>
<td>20.02</td>
<td>37.33</td>
</tr>
<tr>
<td></td>
<td>(–54.87)</td>
<td>(–67.91)</td>
</tr>
<tr>
<td>Constant</td>
<td>–3.273</td>
<td>–5.831</td>
</tr>
<tr>
<td></td>
<td>(–3.107)</td>
<td>(–4.997)</td>
</tr>
<tr>
<td>Observations</td>
<td>96</td>
<td>96</td>
</tr>
</tbody>
</table>

**NOTE:** Standard errors in parentheses.
**TABLE A.6**

Russian Snap Exercises and Disaggregated Green or Blue Exercises

<table>
<thead>
<tr>
<th>Possible Driver of Behavior</th>
<th>Russian Snap Exercises</th>
<th>Russian Snap Exercises</th>
<th>Russian Snap Exercises</th>
<th>Russian Snap Exercises</th>
<th>Russian Snap Exercises</th>
<th>Russian Snap Exercises</th>
</tr>
</thead>
<tbody>
<tr>
<td>Non-NATO participants</td>
<td>0.556**</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(–0.21)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Crude oil price</td>
<td>0.0177</td>
<td>0.0142</td>
<td>0.017</td>
<td>0.0152</td>
<td>0.0178</td>
<td>0.0194</td>
</tr>
<tr>
<td></td>
<td>(–0.0103)</td>
<td>(–0.0116)</td>
<td>(–0.0109)</td>
<td>(–0.0117)</td>
<td>(–0.0109)</td>
<td>(–0.0115)</td>
</tr>
<tr>
<td>Putin’s approval rating</td>
<td>–0.000321</td>
<td>0.00246</td>
<td>0.00665</td>
<td>0.00624</td>
<td>0.00364</td>
<td>0.00551</td>
</tr>
<tr>
<td></td>
<td>(–0.029)</td>
<td>(0.0324)</td>
<td>(–0.0295)</td>
<td>(–0.0333)</td>
<td>(–0.0292)</td>
<td>(–0.0305)</td>
</tr>
<tr>
<td>Defense spending as a</td>
<td>13.27</td>
<td>34.59</td>
<td>6.545</td>
<td>21.75</td>
<td>13.1</td>
<td>22.83</td>
</tr>
<tr>
<td>percentage of GDP</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(–49.87)</td>
<td>(58.61)</td>
<td>(–53.16)</td>
<td>(–60.25)</td>
<td>(–51.8)</td>
<td>(–53.78)</td>
</tr>
<tr>
<td>Eastern Bloc location</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>–0.785*</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>(0.724)</td>
</tr>
<tr>
<td>Former USSR location</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0.534**</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>(–0.18)</td>
</tr>
<tr>
<td>Total number of participants</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>–0.00105</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>(–0.00205)</td>
</tr>
<tr>
<td>Possible Driver of Behavior</td>
<td>Russian Snap Exercises</td>
<td>Russian Snap Exercises</td>
<td>Russian Snap Exercises</td>
<td>Russian Snap Exercises</td>
<td>Russian Snap Exercises</td>
<td></td>
</tr>
<tr>
<td>----------------------------</td>
<td>------------------------</td>
<td>------------------------</td>
<td>------------------------</td>
<td>------------------------</td>
<td>------------------------</td>
<td></td>
</tr>
<tr>
<td>Borders Russia</td>
<td>0.526**</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(-0.197)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>NATO exercise</td>
<td></td>
<td>0.286</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(–0.196)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(-2.909)</td>
<td>(-3.098)</td>
<td>(-2.981)</td>
<td>(-3.29)</td>
<td>(-2.985)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>(-3.112)</td>
<td></td>
</tr>
<tr>
<td>Observations</td>
<td>96</td>
<td>96</td>
<td>96</td>
<td>96</td>
<td>96</td>
<td></td>
</tr>
</tbody>
</table>

NOTE: Standard errors in parentheses. * $p < 0.05$, ** $p < 0.01$. 
<table>
<thead>
<tr>
<th>Possible Driver of Behavior</th>
<th>Russian Snap Assertive Exercises</th>
<th>Russian Snap Assertive Exercises</th>
<th>Russian Snap Assertive Exercises</th>
<th>Russian Snap Assertive Exercises</th>
<th>Russian Snap Assertive Exercises</th>
<th>Russian Snap Assertive Exercises</th>
</tr>
</thead>
<tbody>
<tr>
<td>Non-NATO participants</td>
<td>0.413</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Crude oil price</td>
<td>0.00656</td>
<td>0.00558</td>
<td>0.00599</td>
<td>0.00542</td>
<td>0.00598</td>
<td>0.0134</td>
</tr>
<tr>
<td></td>
<td>(–0.0171)</td>
<td>(0.0176)</td>
<td>(–0.0185)</td>
<td>(–0.0175)</td>
<td>(–0.0177)</td>
<td>(–0.0182)</td>
</tr>
<tr>
<td>Putin’s approval rating</td>
<td>0.0226</td>
<td>0.0248</td>
<td>0.0169</td>
<td>0.0255</td>
<td>0.019</td>
<td>0.0265</td>
</tr>
<tr>
<td></td>
<td>(–0.0486)</td>
<td>(0.0494)</td>
<td>(–0.0514)</td>
<td>(–0.0495)</td>
<td>(–0.0488)</td>
<td>(–0.0485)</td>
</tr>
<tr>
<td>Defense spending as a percentage of GDP</td>
<td>36.59</td>
<td>50.22</td>
<td>31.56</td>
<td>48.14</td>
<td>26.22</td>
<td>46.93</td>
</tr>
<tr>
<td></td>
<td>(–67.39)</td>
<td>(66.89)</td>
<td>(–75.76)</td>
<td>(–66.78)</td>
<td>(–68.86)</td>
<td>(–67)</td>
</tr>
<tr>
<td>Eastern Bloc location</td>
<td>–0.0426</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.738)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Former USSR location</td>
<td>0.558</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(–0.311)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Possible Driver of Behavior</td>
<td>Russian Snap Assertive Exercises</td>
<td>Russian Snap Assertive Exercises</td>
<td>Russian Snap Assertive Exercises</td>
<td>Russian Snap Assertive Exercises</td>
<td>Russian Snap Assertive Exercises</td>
<td>Russian Snap Assertive Exercises</td>
</tr>
<tr>
<td>-----------------------------</td>
<td>---------------------------------</td>
<td>---------------------------------</td>
<td>---------------------------------</td>
<td>---------------------------------</td>
<td>---------------------------------</td>
<td>---------------------------------</td>
</tr>
<tr>
<td>Total number of participants</td>
<td>–0.000317</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Borders Russia</td>
<td>0.645*</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(–0.305)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>NATO exercise</td>
<td>0.478</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(–0.253)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(–4.913)</td>
<td>(–4.994)</td>
<td>(–5.421)</td>
<td>(–5.071)</td>
<td>(4.95)</td>
<td>(5.007)</td>
</tr>
<tr>
<td>Observations</td>
<td>96</td>
<td>96</td>
<td>96</td>
<td>96</td>
<td>96</td>
<td>96</td>
</tr>
</tbody>
</table>

NOTE: Standard errors in parentheses. * p < 0.05.
TABLE A.8  
Russian Long-Range Aviation Flights and U.S. Bomber Flights

<table>
<thead>
<tr>
<th>Possible Driver of Behavior</th>
<th>Russian LRA Flights</th>
</tr>
</thead>
<tbody>
<tr>
<td>U.S. bomber flights</td>
<td>−0.00189 (−0.00399)</td>
</tr>
<tr>
<td>Crude oil price</td>
<td>0.0120* (−0.00516)</td>
</tr>
<tr>
<td>Putin’s approval rating</td>
<td>0.0718*** (−0.0143)</td>
</tr>
<tr>
<td>Defense spending as a percentage of GDP</td>
<td>−48.84* (−21.88)</td>
</tr>
<tr>
<td>Tactical flight hours</td>
<td>0.00329 (−0.00958)</td>
</tr>
<tr>
<td>Constant</td>
<td>−4.943** (−1.834)</td>
</tr>
</tbody>
</table>

Observations 96

NOTE: Standard errors in parentheses. * p < 0.05, ** p < 0.01, *** p < 0.001.
### TABLE A.9
**Russian Routine Exercises or Long-Range Aviation Flights Post-2014**

<table>
<thead>
<tr>
<th>Possible Driver of Behavior</th>
<th>Routine Russian Exercises</th>
<th>Russian LRA Flights</th>
</tr>
</thead>
<tbody>
<tr>
<td>Post-2014</td>
<td>0.126</td>
<td>0.791</td>
</tr>
<tr>
<td>Crude oil price</td>
<td>−0.0441**</td>
<td>0.00594</td>
</tr>
<tr>
<td>Putin’s approval rating</td>
<td>−0.0218</td>
<td>0.0397</td>
</tr>
<tr>
<td>Defense spending as a</td>
<td>−45.17</td>
<td>−72.91*</td>
</tr>
<tr>
<td>percentage of GDP</td>
<td>(−37.57)</td>
<td>(−33.49)</td>
</tr>
<tr>
<td>LRA training flight hours</td>
<td>−0.0216</td>
<td></td>
</tr>
<tr>
<td>Constant</td>
<td>5.062</td>
<td>0.836</td>
</tr>
<tr>
<td></td>
<td>(−3.941)</td>
<td>(−5.312)</td>
</tr>
<tr>
<td>Observations</td>
<td>96</td>
<td>96</td>
</tr>
</tbody>
</table>

NOTE: Standard errors in parentheses. * $p < 0.05$, ** $p < 0.01$. 

---

**TABLE A.9**

**Russian Routine Exercises or Long-Range Aviation Flights Post-2014**

<table>
<thead>
<tr>
<th>Possible Driver of Behavior</th>
<th>Routine Russian Exercises</th>
<th>Russian LRA Flights</th>
</tr>
</thead>
<tbody>
<tr>
<td>Post-2014</td>
<td>0.126</td>
<td>0.791</td>
</tr>
<tr>
<td>Crude oil price</td>
<td>−0.0441**</td>
<td>0.00594</td>
</tr>
<tr>
<td>Putin’s approval rating</td>
<td>−0.0218</td>
<td>0.0397</td>
</tr>
<tr>
<td>Defense spending as a</td>
<td>−45.17</td>
<td>−72.91*</td>
</tr>
<tr>
<td>percentage of GDP</td>
<td>(−37.57)</td>
<td>(−33.49)</td>
</tr>
<tr>
<td>LRA training flight hours</td>
<td>−0.0216</td>
<td></td>
</tr>
<tr>
<td>Constant</td>
<td>5.062</td>
<td>0.836</td>
</tr>
<tr>
<td></td>
<td>(−3.941)</td>
<td>(−5.312)</td>
</tr>
<tr>
<td>Observations</td>
<td>96</td>
<td>96</td>
</tr>
</tbody>
</table>

NOTE: Standard errors in parentheses. * $p < 0.05$, ** $p < 0.01$. 

---
<table>
<thead>
<tr>
<th>Possible Driver of Behavior</th>
<th>Assertive Sea Incidents</th>
<th>Assertive Sea Incidents</th>
<th>Assertive Sea Incidents</th>
<th>Assertive Sea Incidents</th>
</tr>
</thead>
<tbody>
<tr>
<td>U.S. flights</td>
<td>0.00919</td>
<td>0.00919</td>
<td>–0.0212</td>
<td>–0.0212</td>
</tr>
<tr>
<td></td>
<td>(–0.00613)</td>
<td>(–0.00613)</td>
<td>(–0.0233)</td>
<td>(–0.0233)</td>
</tr>
<tr>
<td>Crude oil price</td>
<td>0.000563</td>
<td>0.000563</td>
<td>–0.0212</td>
<td>–0.0212</td>
</tr>
<tr>
<td></td>
<td>(–0.0251)</td>
<td>(–0.0251)</td>
<td>(–0.0233)</td>
<td>(–0.0233)</td>
</tr>
<tr>
<td>Putin’s approval rating</td>
<td>–0.0266</td>
<td>–0.0266</td>
<td>–0.0468</td>
<td>–0.0468</td>
</tr>
<tr>
<td></td>
<td>(–0.0613)</td>
<td>(–0.0613)</td>
<td>(–0.061)</td>
<td>(–0.061)</td>
</tr>
<tr>
<td>Defense spending as a</td>
<td>152.3*</td>
<td>152.3*</td>
<td>111.3</td>
<td>111.3</td>
</tr>
<tr>
<td>percentage of GDP</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(–66.5)</td>
<td>(–66.5)</td>
<td>(–66.39)</td>
<td>(–66.39)</td>
</tr>
<tr>
<td>Tactical flight hours</td>
<td>–0.0117</td>
<td>–0.0117</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(–0.0367)</td>
<td>(–0.0367)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>U.S. sensitive land</td>
<td></td>
<td></td>
<td>0.216</td>
<td>0.216</td>
</tr>
<tr>
<td>exercises</td>
<td></td>
<td></td>
<td>(–0.149)</td>
<td>(–0.149)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>(–6.498)</td>
<td>(–6.498)</td>
</tr>
<tr>
<td>Constant</td>
<td>–4.818</td>
<td>–4.818</td>
<td>–0.879</td>
<td>–0.879</td>
</tr>
<tr>
<td></td>
<td>(–7.889)</td>
<td>(–7.889)</td>
<td>(–6.498)</td>
<td>(–6.498)</td>
</tr>
<tr>
<td>Observations</td>
<td>96</td>
<td>96</td>
<td>96</td>
<td>96</td>
</tr>
</tbody>
</table>

NOTE: Standard errors in parentheses. * p < 0.05.
TABLE A.11
Russian Assertive Air Incidents and Number of U.S. Ships in Black and Baltic Seas

<table>
<thead>
<tr>
<th>Possible Driver of Behavior</th>
<th>Assertive Air Incidents</th>
<th>Assertive Air Incidents</th>
<th>Assertive Air Incidents</th>
<th>Assertive Air Incidents</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of U.S. ships in Black and Baltic seas</td>
<td>0.0982</td>
<td>0.101</td>
<td>0.0167*</td>
<td>0.0159*</td>
</tr>
<tr>
<td></td>
<td>(–0.0759)</td>
<td>(–0.0781)</td>
<td>(–0.00729)</td>
<td>(–0.00782)</td>
</tr>
<tr>
<td>Crude oil price</td>
<td>0.0154**</td>
<td>0.0142</td>
<td>0.0167**</td>
<td>0.0531**</td>
</tr>
<tr>
<td></td>
<td>(–0.00741)</td>
<td>(–0.00784)</td>
<td>(–0.00729)</td>
<td>(–0.0193)</td>
</tr>
<tr>
<td>Putin’s approval rating</td>
<td>0.0525**</td>
<td>0.0479*</td>
<td>0.0573**</td>
<td>0.0531**</td>
</tr>
<tr>
<td></td>
<td>(–0.019)</td>
<td>(–0.0196)</td>
<td>(–0.0185)</td>
<td>(–0.0193)</td>
</tr>
<tr>
<td>Defense spending as a percentage of GDP</td>
<td>87.85***</td>
<td>88.99***</td>
<td>85.94***</td>
<td>85.75***</td>
</tr>
<tr>
<td></td>
<td>(–23.82)</td>
<td>(–24.68)</td>
<td>(–23.83)</td>
<td>(–25.23)</td>
</tr>
<tr>
<td>Tactical flight hours</td>
<td>0.0275*</td>
<td>0.0255</td>
<td>0.0299*</td>
<td>0.0281*</td>
</tr>
<tr>
<td></td>
<td>(–0.0132)</td>
<td>(–0.0137)</td>
<td>(–0.0129)</td>
<td>(–0.0136)</td>
</tr>
<tr>
<td>U.S. sensitive land exercises</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>0.00546</td>
<td>0.0258</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(–0.0857)</td>
<td>(–0.09)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Constant</td>
<td>–11.18***</td>
<td>–7.631</td>
<td>–11.74***</td>
<td>–8.698*</td>
</tr>
<tr>
<td></td>
<td>(–2.748)</td>
<td>(–4.474)</td>
<td>(–2.677)</td>
<td>(–3.642)</td>
</tr>
<tr>
<td>Observations</td>
<td>96</td>
<td>96</td>
<td>96</td>
<td>96</td>
</tr>
</tbody>
</table>

NOTE: Standard errors in parentheses. * p < 0.05, ** p < 0.01, *** p < 0.001.
### TABLE A.12

**Russian Snap Exercises and U.S. Flights**

<table>
<thead>
<tr>
<th>Possible Driver of Behavior</th>
<th>Snap Exercises</th>
<th>Snap Exercises</th>
<th>Snap Exercises</th>
<th>Snap Exercises</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total number of U.S. flights</td>
<td>0.00751</td>
<td>0.00751</td>
<td>0.00751</td>
<td>0.00751</td>
</tr>
<tr>
<td></td>
<td>(–0.00395)</td>
<td>(–0.00395)</td>
<td>(–0.00395)</td>
<td>(–0.00395)</td>
</tr>
<tr>
<td>Crude oil price</td>
<td>0.0475***</td>
<td>0.0475***</td>
<td>0.0423**</td>
<td>0.0423**</td>
</tr>
<tr>
<td></td>
<td>(–0.0133)</td>
<td>(–0.0133)</td>
<td>(–0.0135)</td>
<td>(–0.0135)</td>
</tr>
<tr>
<td>Putin’s approval rating</td>
<td>0.00337</td>
<td>0.00337</td>
<td>0.00695</td>
<td>0.00695</td>
</tr>
<tr>
<td></td>
<td>(–0.0256)</td>
<td>(–0.0256)</td>
<td>(–0.0255)</td>
<td>(–0.0255)</td>
</tr>
<tr>
<td>Defense spending as a percentage of GDP</td>
<td>72.29</td>
<td>72.29</td>
<td>66.76</td>
<td>66.76</td>
</tr>
<tr>
<td></td>
<td>(–46.35)</td>
<td>(–46.35)</td>
<td>(–46.08)</td>
<td>(–46.08)</td>
</tr>
<tr>
<td>Tactical flight hours</td>
<td>0.0541</td>
<td>0.0541</td>
<td>0.0702**</td>
<td>0.0702**</td>
</tr>
<tr>
<td></td>
<td>(–0.0279)</td>
<td>(–0.0279)</td>
<td>(–0.0257)</td>
<td>(–0.0257)</td>
</tr>
<tr>
<td>Number of U.S. ships in Black and Baltic seas</td>
<td>0.134</td>
<td>0.134</td>
<td>0.134</td>
<td>0.134</td>
</tr>
<tr>
<td></td>
<td>(–0.109)</td>
<td>(–0.109)</td>
<td>(–0.109)</td>
<td>(–0.109)</td>
</tr>
<tr>
<td>Constant</td>
<td>–13.75**</td>
<td>–13.75**</td>
<td>–14.56**</td>
<td>–14.56**</td>
</tr>
<tr>
<td></td>
<td>(–4.88)</td>
<td>(–4.88)</td>
<td>(–4.908)</td>
<td>(–4.908)</td>
</tr>
<tr>
<td>Observations</td>
<td>96</td>
<td>96</td>
<td>96</td>
<td>96</td>
</tr>
</tbody>
</table>

**NOTE:** Standard errors in parentheses. ** \( p < 0.01 \), *** \( p < 0.001 \).
<table>
<thead>
<tr>
<th>Possible Driver of Behavior</th>
<th>Assertive Air Incidents (Alaska)</th>
<th>Assertive Air Incidents (Arctic)</th>
<th>Assertive Air Incidents (Eastern Med)</th>
<th>Assertive Air Incidents (Middle East)</th>
<th>Assertive Air Incidents (North Sea)</th>
<th>Assertive Air Incidents (Pacific)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total number of U.S. flights</td>
<td>$-0.00671$</td>
<td>$-0.018$</td>
<td>$0.0129$</td>
<td>$0.00343$</td>
<td>$-0.00034$</td>
<td>$-0.00537$</td>
</tr>
<tr>
<td>Crude oil price</td>
<td>$-0.0357$</td>
<td>$0.0169$</td>
<td>$0.0526$</td>
<td>$-0.0317$</td>
<td>$0.0445^*$</td>
<td>$-0.00103$</td>
</tr>
<tr>
<td>Putin's approval rating</td>
<td>$-0.135$</td>
<td>$0.104$</td>
<td>$0.0424$</td>
<td>$0.215$</td>
<td>$0.113^*$</td>
<td>$-0.0415$</td>
</tr>
<tr>
<td>Defense spending as a percentage of GDP</td>
<td>$104.1$</td>
<td>$-69.34$</td>
<td>$187$</td>
<td>$30.62$</td>
<td>$171.4$</td>
<td>$8.67$</td>
</tr>
<tr>
<td>Tactical flight hours</td>
<td>$-0.127$</td>
<td>$0.113$</td>
<td>$0.2$</td>
<td>$0.0367$</td>
<td>$-0.00611$</td>
<td>$-0.00417$</td>
</tr>
<tr>
<td>Constant</td>
<td>$19.31$</td>
<td>$-20.98$</td>
<td>$-41.21$</td>
<td>$-24.01$</td>
<td>$-19.72^*$</td>
<td>$1.335$</td>
</tr>
</tbody>
</table>

**NOTE:** Standard errors in parentheses. *$p < 0.05$.**
<table>
<thead>
<tr>
<th>Possible Driver of Behavior</th>
<th>Assertive Sea Incidents (Pacific)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of U.S. ships in Black and Baltic Seas</td>
<td>1.396 (-1.804)</td>
</tr>
<tr>
<td>Crude oil price</td>
<td>-0.302 (-0.299)</td>
</tr>
<tr>
<td>Putin’s approval rating</td>
<td>0.216 (-0.489)</td>
</tr>
<tr>
<td>Defense spending as a percentage of GDP</td>
<td>-281.4 (-778.4)</td>
</tr>
<tr>
<td>Tactical flight hours</td>
<td>-0.428 (-0.734)</td>
</tr>
<tr>
<td>Constant</td>
<td>46.11 (-83.74)</td>
</tr>
<tr>
<td>Observations</td>
<td>96</td>
</tr>
</tbody>
</table>

NOTE: Standard errors in parentheses.
### TABLE A.15
All Russian Assertive Incidents and U.S. Flights

<table>
<thead>
<tr>
<th>Possible Driver of Behavior</th>
<th>All Assertive</th>
<th>Low-Level Assertive</th>
<th>High-Level Assertive</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total number of U.S. flights</td>
<td>0.00549*</td>
<td>0.00565*</td>
<td>0.00803</td>
</tr>
<tr>
<td></td>
<td>(–0.00218)</td>
<td>(–0.00223)</td>
<td>(–0.00467)</td>
</tr>
<tr>
<td>Crude oil price</td>
<td>0.0199**</td>
<td>0.0189**</td>
<td>0.0277</td>
</tr>
<tr>
<td></td>
<td>(–0.00701)</td>
<td>(–0.0072)</td>
<td>(–0.0172)</td>
</tr>
<tr>
<td>Putin's approval rating</td>
<td>0.0505**</td>
<td>0.0467**</td>
<td>0.0571</td>
</tr>
<tr>
<td></td>
<td>(–0.0177)</td>
<td>(–0.0181)</td>
<td>(–0.0443)</td>
</tr>
<tr>
<td>Defense spending/GDP</td>
<td>99.96***</td>
<td>101.5***</td>
<td>113.9*</td>
</tr>
<tr>
<td></td>
<td>(–22.37)</td>
<td>(–22.84)</td>
<td>(–51.85)</td>
</tr>
<tr>
<td>Tactical flight hours</td>
<td>0.0148</td>
<td>0.0124</td>
<td>0.0407</td>
</tr>
<tr>
<td></td>
<td>(–0.014)</td>
<td>(–0.0142)</td>
<td>(–0.0337)</td>
</tr>
<tr>
<td>Constant</td>
<td>–8.444**</td>
<td>–8.131**</td>
<td>–17.05**</td>
</tr>
<tr>
<td></td>
<td>(–3)</td>
<td>(–2.879)</td>
<td>(–6.44)</td>
</tr>
<tr>
<td>Observations</td>
<td>96</td>
<td>96</td>
<td>96</td>
</tr>
</tbody>
</table>

NOTE: Standard errors in parentheses. * p < 0.05, ** p < 0.01, *** p < 0.001
### TABLE A.16

**All Russian Assertive Incidents and Number of U.S. Ships in the Black and Baltic Seas**

<table>
<thead>
<tr>
<th>Possible Driver of Behavior</th>
<th>All Assertive</th>
<th>Low-Level Assertive</th>
<th>High-Level Assertive</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of U.S. ships in Black and Baltic Seas</td>
<td>0.138*</td>
<td>0.141*</td>
<td>0.144</td>
</tr>
<tr>
<td></td>
<td>(–0.0681)</td>
<td>(–0.0694)</td>
<td>(–0.148)</td>
</tr>
<tr>
<td>Crude oil price</td>
<td>0.0137</td>
<td>0.0123</td>
<td>0.0179</td>
</tr>
<tr>
<td></td>
<td>(–0.00731)</td>
<td>(–0.00749)</td>
<td>(–0.0175)</td>
</tr>
<tr>
<td>Putin’s approval rating</td>
<td>0.0416*</td>
<td>0.0373*</td>
<td>0.0496</td>
</tr>
<tr>
<td></td>
<td>(–0.018)</td>
<td>(–0.0184)</td>
<td>(–0.0435)</td>
</tr>
<tr>
<td>Defense spending as a percentage of GDP</td>
<td>96.41***</td>
<td>97.71***</td>
<td>102.7*</td>
</tr>
<tr>
<td></td>
<td>(–22.49)</td>
<td>(–22.94)</td>
<td>(–50.42)</td>
</tr>
<tr>
<td>Tactical flight hours</td>
<td>0.0269*</td>
<td>0.0246</td>
<td>0.0579</td>
</tr>
<tr>
<td></td>
<td>(–0.0126)</td>
<td>(–0.0128)</td>
<td>(–0.0305)</td>
</tr>
<tr>
<td>Constant</td>
<td>–8.299**</td>
<td>–7.864**</td>
<td>–16.53*</td>
</tr>
<tr>
<td></td>
<td>(–3.013)</td>
<td>(–2.961)</td>
<td>(–6.552)</td>
</tr>
<tr>
<td>Observations</td>
<td>96</td>
<td>96</td>
<td>96</td>
</tr>
</tbody>
</table>

**NOTE:** Standard errors in parentheses. *p < 0.05, **p < 0.01, ***p < 0.001.
## TABLE A.17
### All Russian Assertive Incidents and Sensitive Exercises

<table>
<thead>
<tr>
<th>Possible Driver of Behavior</th>
<th>All Assertive</th>
<th>Low-Level Assertive</th>
<th>High-Level Assertive</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sensitive exercises</td>
<td>0.0996</td>
<td>0.111</td>
<td>0.291*</td>
</tr>
<tr>
<td></td>
<td>(–0.0777)</td>
<td>(–0.0783)</td>
<td>(–0.142)</td>
</tr>
<tr>
<td>Crude oil price</td>
<td>0.0163*</td>
<td>0.015</td>
<td>0.023</td>
</tr>
<tr>
<td></td>
<td>(–0.00747)</td>
<td>(–0.00768)</td>
<td>(–0.0184)</td>
</tr>
<tr>
<td>Putin’s approval rating</td>
<td>0.0486**</td>
<td>0.0443*</td>
<td>0.0591</td>
</tr>
<tr>
<td></td>
<td>(–0.0179)</td>
<td>(–0.0183)</td>
<td>(–0.0433)</td>
</tr>
<tr>
<td>Defense spending as a</td>
<td>88.60***</td>
<td>89.18***</td>
<td>88.72</td>
</tr>
<tr>
<td>percentage of GDP</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(–23.31)</td>
<td>(–23.84)</td>
<td>(–52.32)</td>
</tr>
<tr>
<td>Tactical flight hours</td>
<td>0.0302*</td>
<td>0.0278*</td>
<td>0.0604</td>
</tr>
<tr>
<td></td>
<td>(–0.0128)</td>
<td>(–0.013)</td>
<td>(–0.0321)</td>
</tr>
<tr>
<td>Constant</td>
<td>–9.473****</td>
<td>–8.975**</td>
<td>–17.64*</td>
</tr>
<tr>
<td></td>
<td>(–2.864)</td>
<td>(–2.879)</td>
<td>(–6.944)</td>
</tr>
<tr>
<td>Observations</td>
<td>96</td>
<td>96</td>
<td>96</td>
</tr>
</tbody>
</table>

**NOTE:** Standard errors in parentheses. * p < 0.05, ** p < 0.01, *** p < 0.001.
### TABLE A.18

**Russian Assertive Air Incidents and Russian Tactical Flight Training Hours**

<table>
<thead>
<tr>
<th>Possible Driver of Behavior</th>
<th>All Assertive Air</th>
<th>Low-Level Assertive Air</th>
<th>High-Level Assertive Air</th>
</tr>
</thead>
<tbody>
<tr>
<td>Crude oil price</td>
<td>0.00918</td>
<td>0.00816</td>
<td>0.00983</td>
</tr>
<tr>
<td></td>
<td>(–0.00836)</td>
<td>(–0.00831)</td>
<td>(–0.0182)</td>
</tr>
<tr>
<td>Defense spending as a percentage of GDP</td>
<td>1.102***</td>
<td>1.096***</td>
<td>0.748</td>
</tr>
<tr>
<td></td>
<td>(–0.333)</td>
<td>(–0.329)</td>
<td>(–0.541)</td>
</tr>
<tr>
<td>Tactical flight hours</td>
<td>0.0283</td>
<td>0.0259</td>
<td>0.0587</td>
</tr>
<tr>
<td></td>
<td>(–0.0156)</td>
<td>(–0.0155)</td>
<td>(–0.0323)</td>
</tr>
<tr>
<td>Constant</td>
<td>–7.312**</td>
<td>–6.983**</td>
<td>–11.15</td>
</tr>
<tr>
<td></td>
<td>(–2.662)</td>
<td>(–2.641)</td>
<td>(–5.726)</td>
</tr>
<tr>
<td>Observations</td>
<td>96</td>
<td>96</td>
<td>96</td>
</tr>
</tbody>
</table>

**NOTE:** Standard errors in parentheses. ** $p < 0.01$, *** $p < 0.001$. 
### TABLE A.19

**All Russian Assertive Incidents and Putin’s Approval Rating**

<table>
<thead>
<tr>
<th>Possible Driver of Behavior</th>
<th>All Assertive</th>
<th>Low-Level Assertive</th>
<th>High-Level Assertive</th>
</tr>
</thead>
<tbody>
<tr>
<td>Putin’s approval rating</td>
<td>0.0482**</td>
<td>0.0442**</td>
<td>0.0551</td>
</tr>
<tr>
<td></td>
<td>(–0.0167)</td>
<td>(–0.017)</td>
<td>(–0.0426)</td>
</tr>
<tr>
<td>Crude oil price</td>
<td>0.0145*</td>
<td>0.0132*</td>
<td>0.0194</td>
</tr>
<tr>
<td></td>
<td>(–0.00662)</td>
<td>(–0.00672)</td>
<td>(–0.0172)</td>
</tr>
<tr>
<td>Defense spending as a percentage of GDP</td>
<td>94.92***</td>
<td>96.25***</td>
<td>98.24*</td>
</tr>
<tr>
<td></td>
<td>(–21)</td>
<td>(–21.21)</td>
<td>(–49.54)</td>
</tr>
<tr>
<td>Tactical flight hours</td>
<td>0.0293*</td>
<td>0.0272*</td>
<td>0.0608*</td>
</tr>
<tr>
<td></td>
<td>(–0.0115)</td>
<td>(–0.0115)</td>
<td>(–0.0299)</td>
</tr>
<tr>
<td>Constant</td>
<td>–10.87***</td>
<td>–10.30***</td>
<td>–17.07**</td>
</tr>
<tr>
<td></td>
<td>(–2.414)</td>
<td>(–2.441)</td>
<td>(–6.364)</td>
</tr>
<tr>
<td>Observations</td>
<td>96</td>
<td>96</td>
<td>96</td>
</tr>
</tbody>
</table>

**NOTE:** Standard errors in parentheses. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$
<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>ADIZ</td>
<td>Air Defense Identification Zone</td>
</tr>
<tr>
<td>AGI</td>
<td>Auxiliary, General, Intelligence</td>
</tr>
<tr>
<td>AOR</td>
<td>area of responsibility</td>
</tr>
<tr>
<td>BMD</td>
<td>ballistic missile defense</td>
</tr>
<tr>
<td>CI</td>
<td>confidence interval</td>
</tr>
<tr>
<td>CONOPs</td>
<td>concepts of operations</td>
</tr>
<tr>
<td>DVIDS</td>
<td>Defense Visual Information Distribution Service</td>
</tr>
<tr>
<td>DFE</td>
<td>dynamic force employment</td>
</tr>
<tr>
<td>ELN</td>
<td>European Leadership Network</td>
</tr>
<tr>
<td>EUCOM</td>
<td>U.S. European Command</td>
</tr>
<tr>
<td>EUROCONTROL</td>
<td>European Organisation for the Safety of Air Navigation</td>
</tr>
<tr>
<td>GDP</td>
<td>gross domestic product</td>
</tr>
<tr>
<td>ICAO</td>
<td>International Civil Aviation Organization</td>
</tr>
<tr>
<td>INCSEA</td>
<td>U.S.-Soviet Agreement on the Prevention of Incidents on and over the High Seas</td>
</tr>
<tr>
<td>INDOPACOM</td>
<td>U.S. Indo-Pacific Command</td>
</tr>
<tr>
<td>IR</td>
<td>international relations</td>
</tr>
<tr>
<td>IRR</td>
<td>incident rate ratio</td>
</tr>
<tr>
<td>ISR</td>
<td>intelligence, surveillance, and reconnaissance</td>
</tr>
<tr>
<td>LIMS-EV</td>
<td>Logistics, Installations and Mission Support—Enterprise View</td>
</tr>
<tr>
<td>LRA</td>
<td>long-range aviation</td>
</tr>
<tr>
<td>NATO</td>
<td>North Atlantic Treaty Organization</td>
</tr>
<tr>
<td>PDMA</td>
<td>Agreement on the Prevention of Dangerous Military Activities</td>
</tr>
<tr>
<td>USAF</td>
<td>U.S. Air Force</td>
</tr>
<tr>
<td>VKS</td>
<td>Aerospace Forces (Russia)</td>
</tr>
</tbody>
</table>


EUCOM—See U.S. European Command.


“From the Horse’s Mouth: In a Climb,” Krasnaya Zvezda, December 8, 2010.


NATO—See North Atlantic Treaty Organization.


North Atlantic Treaty Organization Allied Air Command, “We Secure the Skies,” webpage, undated. As of February 24, 2021: https://ac.nato.int/missions/air-policing


*Stars and Stripes*, homepage, undated. As of August 17, 2021: https://www.stripes.com/
https://www.cusnc.navy.mil/Media/News/Display/Article/2054258/
statement-regarding-interaction-between-uss-farragut-and-russian-navy-ship/


Stockholm International Peace Research Institute, “SIPRI Military Expenditure Database,” database, undated. As of August 17, 2021:
https://www.sipri.org/databases/milex


Tilghman, Andrew, “Russian Attack Aircraft Just Flew Within 30 Feet of a U.S. Navy Ship,” Military Times, April 13, 2016. As of February 17, 2021:


“Training Time for Southern MD Base Pilots up by 50%,” Interfax, November 27, 2014.


Moscow regularly uses limited military actions—far short of direct aggression but often creating escalatory risks—that have caused concern and consternation in Western capitals. It is, however, far from clear what Russia intends to signal through these actions. Different understandings of Moscow’s objectives could lead to dramatically divergent interpretations of events.

In the first comprehensive analysis of Russian coercive signaling toward the United States and its allies, the authors of this report analyze these activities over recent years to provide a better understanding of the drivers of Moscow’s behavior and practical guidelines for assessing future events. The authors posit several hypotheses regarding Russian motives and evaluated them using three methods: an examination of Russian strategic writing and leadership statements on the topic, a quantitative modeling effort, and qualitative case studies of specific incidents.

The authors found solid empirical grounds to make judgments about Russia’s motives. They suggest that much of the assertive, dangerous, or unsafe Russian activity appears to be directed at shaping specific patterns of ongoing U.S. or allied behavior. Moscow appears to be using coercive signals to send targeted messages regarding activities that it finds problematic. Most Russian proactive activities, such as scheduled exercises or strategic bomber training flights, convey general deterrence signals and do not pose immediate safety concerns. Using their analysis of past Russian behavior, the authors provide tools to discern the possible motives behind future activities.