Chapter 2
Why a Critical-Thinking Framework?

Bottom Line Up Front

Critical thinking has become increasingly important over the past few decades. Employers in both the public and private sectors seek employees with critical problem-solving and decision-making skills. Many people lack those skills because formal critical-thinking instruction has not been part of their educational or professional backgrounds. When people do not use critical thinking, it often results in a number of poor problem-solving tendencies and leads to both cognitive and personal biases, which may severely degrade the results of their thinking. This chapter summarizes a number of popular critical-thinking frameworks and synthesizes the material to create a Security Analysis Critical-Thinking Framework. The goal is to ensure future security analysts and decision makers have the skills to address complex problems, as U.S. decision makers demonstrated in the 1962 Cuban Missile Crisis case study presented at chapter's end.

Employers Want Thinkers!

Critical thinking is important because employers seek these skills in their employees. In one key area of security analysis, the Office of the Director of National Intelligence (ODNI) mandated all intelligence analysts must be trained in and use critical thinking.[1] Having skills in critical thinking and problem solving increasingly are found in job advertisements in both the public and private sectors. The National Association of Colleges and Employers' *2018 Job Outlook Survey* found 99.2% of employers surveyed deemed critical thinking and problem solving as essential and rated them at the top of all other desired skills and

competencies sought in new hires.[2] Employers want employees who can solve problems through evaluating, analyzing, and synthesizing information. They seek employees who can be reflective, foster understanding, guide sound decision making, and manage actions. Employees are sought who can combine facts, logic, and reasoning and not just apply intuition, emotions, and feelings to their analyses. As the Industrial Age has given way to the Information Age, employees are sought who are open-minded and flexible in their thinking in order to foster the creativity and innovation required in the future in both the public and private sectors. Critical thinking supports this Information Age need.

Although there are a number of definitions for critical thinking, a good general definition offers **critical thinking** as a "mode of thinking—about any subject, content, or problem—in which the thinker improves the quality of his or her thinking by skillfully taking charge of the structures inherent in thinking and imposing intellectual standards upon them."[3] In other words, critical thinking entails "[t]hinking about your thinking while you are thinking in order to make your thinking better…."[4] Critical thinking must be both *active* and *systematic*. An active thinker selects the critical-thinking framework to use and reflects on the use of the framework throughout the analysis. A systematic thinker follows a framework's detailed steps and records their work for later review so other analysts may evaluate the **validity** of the results. To achieve validity, thinkers must work to reduce bias in their findings. The main contribution of critical thinking is the reduction of biases in findings supporting problem solving and decision making. A good critical thinker projects the characteristics summarized in Figure 2.1.

Figure 2.1 **Characteristics of a Good Critical Thinker**[5]

- Raises vital questions and problems, formulating them clearly and precisely.
- Gathers and assesses relevant information and effectively interprets it.
- Comes to well-reasoned conclusions and solutions, testing them against relevant criteria and standards.
- Thinks open-mindedly within alternative systems of thought, recognizing and assessing as needed, their assumptions, implications, and practical consequences.
- Communicates effectively with others in figuring out solutions to complex problems.

Humans are not born with critical-thinking skills—they must be taught. These skills cannot be gained in a single class or course. Similar to how the English language and mathematics are taught continuously across elementary and secondary education, the frameworks and techniques for critical thinking must be initially taught, more advanced techniques added over time, and the techniques exercised and thinking evaluated over a number of years. Without instruction and experience in critical thinking, human thought when "left to itself, is biased, distorted, partial, uninformed, or downright prejudiced."[6] Critical thinking has historically not been taught as a decision-making tool in U.S. elementary, secondary, or even post-secondary curriculums. Those who should be teaching critical thinking to meet today's workforce demands are generally not familiar with critical-thinking frameworks and techniques.

People without critical-thinking skills usually develop a number of non-critical-thinking tendencies. These non-critical-thinking tendencies are the result of a lifetime of influences from their education, family, friends, workmates, politicians, religion, news media, entertainment industry, and other sources. These influences often highlight how thinking should be fun, exciting, easy,

spontaneous, free, chic, popular, patriotic, and beneficial to the thinker—in fact, none of these are characteristics of good thinking. Figure 2.2 lists the tendencies of poor thinking many people develop as a result of their lack of critical-thinking instruction and experience. Overcoming these poor-thinking tendencies presents severe challenges in critical-thinking instruction.

Figure 2.2 Poor-Thinking Tendencies[7]

- Given a question or problem, immediately jump to a finding or conclusion.
- Fail to complete good information searches.
- **Satisfice** or settle on the first conclusion appearing good enough.
- Confuse thinking hard with just discussing the information
- Rely on imprecise analogies that lack background and context.
- Fail to use a systematic process to structure the analysis.
- Identify incorrect patterns and false causality in data.
- Fail to consider all alternatives, resulting in a narrow range of options.
- Avoid addressing the question or problem.
- Commit informal logic fallacies (Appendix I).
- Generate unmitigated and unrecognized biases (Appendix II).

Understanding Bias

Critical thinking reduces **bias** in research, analysis, problem solving, and decision making. Those who do not use critical-thinking frameworks often tend to add significant bias to their arguments and statements. One dictionary definition of bias holds it is "a highly personal and unreasoned distortion of judgment."[8] Bias usually results from a person taking intellectual shortcuts or a failure to

thoroughly think through an issue. It is a deviation from the truth. Bias and the validity of analyses are indirectly related, as increasing bias leads to decreasing validity in an analysis. Bias has two major sources. First, bias may be cognitive in how a person's brain works; i.e., how the brain has been "programmed" by all the influences in the person's life. Such biases may be present even if the person is aware of them. Second, bias may be personal, meaning it emerges from a person's individual belief system. Cognitive and personal biases differ for each person. Biases influence mindsets, which subsequently affects the results of thinking. Figure 2.3 summarizes the most common types of cognitive biases in security analysis. Chapter 6 looks deeper into personal biases as part of personal belief systems. Appendixes I and II, respectively, summarize an expanded list of logic fallacies and heuristics (cognitive biases) common in poor thinking and reasoning. Chapter 6 and Appendixes III reveal how personal biases often result from differing cultures and belief systems.

Figure 2.3 **Common Cognitive Biases in Security Analysis**[9]

- **Confirmation (Affirmation) Bias** – accepting only evidence that supports a pre-formed point of view and rejecting evidence contrary to this pre-formed point of view (probably the most prevalent bias in all societies).
- **Anchoring Bias** – focusing on one trait or piece of information to the exclusion of other information, especially new information.
- **Perception Bias** – assuming the opponent will think or act just as the analyst would or as others in the same position have acted in the past. (**Mirror-imaging**)
- **Representativeness Bias** – explaining the opponent's decisions or behaviors based on their ideology or other traits (e.g., political views, religion, ethnic group, language, country of origin, etc.). (**Stereotyping**)
- **Group Conformity Bias** – agreeing with the recommendations, findings, or points of view of the group to facilitate group cohesion, even though

the person has strong information or analysis supporting different alternatives. (**Groupthink**)

- **Fundamental Attribution Bias** – over-emphasizing the personality-based explanations (opponent's internal traits such as motivation, risk aversion, decision-making tendencies, etc.) over structural factors (laws and regulations, organizational or bureaucratic influences, other outside structural influences, etc.).
- **Blind-Spot Bias** – being unaware of and failing to consider analyst's personal biases, even as they recognize biases in others.

Thinking, Fast and Slow

The work of Nobel laureate Daniel Kahneman provides additional insight on the sources and effects of cognitive biases. Cognitive psychologist Kahneman, and his colleague Amos Teversky, explained how people do not apply the full force of reason to their thinking but instead utilize shortcuts called heuristics that bias decision processes.[10] Kahneman won the 2002 Nobel Prize in Economics by demonstrating how economic decisions are influenced by a combination of heuristics leading to cognitive biases and are not simply based on rational monetary considerations (gains or losses). This refuted decades of economic-man theory where decision making in the face of uncertainty was based on primarily rational choices. Kahneman explains over 40 different heuristics in his book *Thinking, Fast and Slow*[11] and argues one or more of these heuristics affect all human decision-making situations depending on the person and issue under consideration. These heuristics result in cognitive biases that degrade the results of the thinking and decision making. Appendix II provides a summary of Kahneman's heuristics as they apply to security analysis.

Kahneman makes use of an abstract psychology model to explain the influence of heuristics on human thinking. This abstract model offers two

competing brain systems for human thought—**System 1 (Fast) Thinking** and **System 2 (Slow) Thinking**.[12] System 1 thinking governs the majority of a person's everyday behavior and decision making. This type of thinking is not only fast, but also largely effortless, and takes place primarily in the subconscious. A System 1 thinker is good at data recall and looks for patterns and associations in data already known or recently found. That person also looks for situations governed by causality (but not always successfully). System 1 thinkers tend to create stories to explain events and strive to avoid cognitive dissonance by making the person's thinking more consistent. System 1 thinking is very intuitive (sometimes called a "gut feeling") and governs most everyday human behavior. For example, System 1 is in action when people do not spend much mental effort deciding what clothes to wear each day. System 1 also takes over in immediate crisis situations that lack time for deeper thinking. System 1 is at play during a person's immediate reactions (to brake, steer away, etc.) when a car unexpectedly pulls in front of them in traffic.

System 1 thinking is correct the majority of time. It may not be correct; however, when the decision-making situation is not routine, not an immediate crisis, or calls for complex thinking. System 1 thinkers often jump to conclusions based on poor assumptions. In other words, a person's lack of mental effort drives most of the poor-thinking tendencies listed in Figure 2.2. System 1 thinkers may rely too much on unhelpful emotional responses, which can result in bias. Kahneman argues when System 1 thinking is not correct, one or more heuristics leading to cognitive bias (see Figure 2.3 and Appendix II) can usually be identified at work.

For situations requiring more robust and complex thought, System 2 thinking is required. System 2 thinking requires conscious effort and is very deliberative. System 2 thinkers can handle abstract concepts and are grounded in logic, data, and reasoning. This system is good for employing advanced mathematics and statistics. System 2 is good for reductive thinking, meaning taking complex conceptual or empirical situations and reducing them to more

understandable basic or simple models. The downfall of System 2 thinking includes that it requires significant mental effort, time, and energy—which could lead to analytic or decision-making fatigue. A person's System 2 thinking also can result in carelessness. There are times when System 1 thinkers will defer a decision situation to a System 2 solution. But, because a System 2 thinker's process can be lackadaisical, it will accept the System 1 solution without taking the time and effort to complete a more robust analysis.

Most people successfully employ a combination of System 1 and System 2 thinking in their professional and personal decision making. It is mainly a person's System 1 thinking techniques and tendencies that have been developed and used since birth. A person's abilities to conduct System 2 thinking will depend on their level of education, intellectual curiosity, and flexibility in their thought processes. Critical thinking is designed to improve System 2 thinking as it provides systematic techniques for reducing System 1 thinking cognitive and personal biases. System 1 thinking still has its place in everyday human behavior and decision making. However, to become a good analyst, problem solver, or decision maker, the systematic techniques of critical thinking must be applied to improve System 2 thinking. Additionally, the person must be ready to expend the mental effort required to make System 2 thinking successful.

Differing Critical-Thinking Frameworks

People learning and teaching critical thinking are faced with a number of differing frameworks used by both practitioners and academics. Some frameworks are more complete and effective than others; for example, some frameworks are tailored for a particular profession or academic discipline. Figure 2.4 presents a sample of differing critical-thinking frameworks useful in security analysis. The following short discussions of these frameworks helps provide a better understanding of the evolution of critical thinking and how these frameworks are used in this book.

Figure 2.4	**Critical-Thinking Frameworks Useful in Security Analysis**		
Framework	**Author(s)**	**Steps, Elements, or Tools**	**Origins/Use**
Formal Logic	Ennis[13]	FRISCO: **F**ocus, **R**easons, **I**nference, **S**ituation, **C**larity, **O**verview	Philosophy, History, Journalism
Scientific Method	Multiple	Purpose/Question, Theory, Hypotheses, Research Design, Data Collection, Hypothesis Testing/Data Analysis, Findings	Natural Sciences, Social Sciences
Assumptions Analysis	Brookfield[14]	Analyzing Paradigmatic, Prescriptive, and Causal Assumptions	Social Sciences, Critical Theory
Creative Problem Solving	Puccio, Mance, Murdock[15]	Assessing the Situation, Exploring the Vision, Promulgating Challenges, Exploring Ideas, Formulating Solutions, Exploring Acceptance, and Formulating a Plan	Business & Management
Strategic Intelligence	Pherson & Pherson[16]	Questions, Assumptions, Reach Out to Other Sources, Evaluate Data, Assess Data & Form Hypotheses, Evaluate Hypotheses, Draw Conclusions, Generate Findings	Intelligence Analysis
Eightfold Path[17]	Bardach[18]	Define Problem, Assemble Evidence, Construct Alternatives, Select Evaluation Criteria, Project	Policy Analysis

		Outcomes, Confront Trade-Offs, Focus-Narrow-Deepen-Decide, Tell the Story	
Elements of Thought	Paul & Elder,[19] Nosich[20]	Purpose, Questions, Information, Context, Points of View, Assumptions, Alternatives, Conceptualization, Interpretation & Inference, Implications & Consequences	For any Professional, Academic, or Personal Analyses

The **Formal Logic** framework traces its lineage as far back as the teachings of Greek philosophers Socrates (470-399 BCE), Plato (428-347 BCE), and Aristotle (384-322 BCE). The focus of logic is to combine facts, logic, and reasoning to generate supportable arguments. Robert Ennis created the FRISCO critical-thinking framework by employing techniques from formal logic taught in college courses offered mainly by philosophy programs.[21] Formal logic is used widely in the fields of philosophy, history, journalism, and computer programming. In his book, *Reasoning for Intelligence Analysts*, Noel Henrickson provides a multidimensional approach that combines formal logic with aspects of critical thinking and the scientific method.[22] Logic teaching generally supports the **inductive approach to research**, which starts with the information (data, facts, evidence) already collected, or about to be collected, and then works from the information to the findings and conclusions. Inductive analyses often lack conceptual frameworks and often preclude validity checks on the findings of the analysis. In security analysis, the tenets of logic (logical argumentation) are used extensively in preparing presentations of analytic findings. Chapters 9 and 11 include more discussion on logical argumentation.

The **Scientific Method** emerged in the late-18th and early-19th centuries as human technical knowledge expanded with the emergence of the Industrial Age.

The majority of U.S. elementary and secondary school curriculums teach the basics of the scientific method. Today, in both the practitioner and academic worlds, this method is used in the natural and social sciences. The scientific method creates knowledge by combining **rationalism** (human abilities to reason) with **empiricism** (use of data, facts, evidence). This method employs a number of robust analytic techniques, including those for determining the validity of analytic findings. The scientific method supports the **deductive approach to research**, which starts with the existing knowledge and theory on the issue, develops hypotheses/alternatives and a research design, then carries out additional data collection and data analysis to test the hypotheses/alternatives, which lead to the findings and conclusions. Mathematics and statistics are frequently used in the data analysis. Problems with the scientific method as used in the social sciences (where security analysis resides) include the failure to thoroughly investigate the context and assumptions at play in the analysis and failure to test a complete range of alternative hypotheses. These failures in social science research usually result from the analyst's personal adoption of one narrow theoretical point of view, which ignores alternative theories and thus can add significant bias to the findings. Analysts who work mainly with qualitative studies, such as security studies, tend to waiver from the scientific method.[23] In security analysis, the scientific method's analytic techniques are best used in conjunction with other critical-thinking frameworks. The scientific method is discussed in more detail in Chapter 3.

Assumptions Analysis provides guidance on "hunting" assumptions and assessing alternative perspectives. It offers three distinct categories of assumptions: paradigmatic, prescriptive, and causal. This framework describes how a person may think critically and solve problems simply by the analysis of assumptions involved in the situation.[24] Unlike other critical-thinking frameworks, assumptions analysis provides the techniques for security analysts to dig deeper into the assumptions of competing perspectives, including assessing the

assumptions of the analysts themselves. This framework is covered in greater detail in Chapter 6.

Creative Problem Solving is a robust critical-thinking framework emerging in the last decade for inclusion in business administration and management courses. It supports the increasing call starting in the 2000s from private sector employers seeking critical-thinking and problem-solving skills in new employees. The pillars of creative problem solving focus on harnessing situations of change, energizing leadership and creativity, and generating innovation in business and industry. The steps of this framework are similar to those in the other critical-thinking frameworks. The creative problem-solving framework uses a number of specific techniques to support the analysis. For example, it promotes the technique of 5Ws + 1H (Who, What, When, Where, Why, and How) as a systematic technique to get to the heart of a problem.[25] The 5Ws + 1H technique is explained in more detail in Chapter 8, along with other creative problem-solving techniques that also are applicable to security analysis. The creative problem-solving framework includes steps for exploring acceptance of the analytic findings and recommendations and formulating a plan for instituting recommendations, which are critical to security policy analysis and are covered in more detail in Chapter 10.

The **Strategic Intelligence Critical-Thinking** framework is also new in the last decade. It is in response to the U.S. Office of the Director of Nation al Intelligence's directions that intelligence analysts must be trained in both critical thinking and structured analytic techniques (SATs) to produce intelligence products.[26] SATs are preformed checklists and models used to inject systematic thinking into the analytic process. Chapters 4 to 11 provide a modified version of the strategic intelligence critical-thinking framework and combine this framework with the scientific method, elements of thought, SATs and other analytic techniques. Mastering the strategic intelligence framework and its expanded use of SATs is recommended for all intelligence analysts, as it builds on the foundation of critical thinking and SAT employment presented herein.

The **Eightfold Path** framework has been used widely in policy analysis for several decades. Even before the demand for critical-thinking skills increased, the eightfold path provided a framework to actively and systematically address policy analysis and decision making. Its emphasis on developing a complete range of alternatives (Chapter 8) is particularly applicable to security analysis. It also emphasizes the consideration of resources (benefit/cost analysis) and politics (acceptability of findings to decision makers) as part of the analysis. Mastering the eightfold path framework and its techniques is recommended for all security policy analysts, as it builds on the foundation of critical thinking introduced in this book.

The **Elements-of-Thought** framework was developed by the California-based Foundation for Critical Thinking and is the main framework used in this book.[27] The framework's ten elements have been around for several years. The original eight elements were created by academics Richard Paul and Linda Elder.[28] Teaching support materials (books, pamphlets, posters, etc.) to assist students in learning these elements are readily available.[29] Gerald Nosich, another Foundation for Critical Thinking associate, added the two additional elements of context and alternatives.[30] As will be seen in this book, context and alternatives are vital to good security analysis. Later in this chapter, there is a more detailed description of the elements of thought, which are taught at some academic institutions and have been adopted as the standard for much of the intelligence community critical-thinking training. The elements of thought are both the most comprehensive and most flexible of all the critical-thinking frameworks. Any of the other frameworks in Figure 2.4 may be synthesized and employed with the elements of thought. The framework is useful for both the inductive and deductive approaches to logical reasoning. A major advantage of the elements of thought is how the framework goes beyond practitioner analysis and academic research and also can be used in personal decision making.

A Security Analysis Critical-Thinking Framework

The best framework for reducing both cognitive and personal biases and improving System 2 thinking in security analysis is to combine the elements-of-thought and scientific method frameworks introduced in Figure 2.4. Additionally, these two frameworks must be supplemented with other techniques found in other critical-thinking frameworks in Figure 2.4. This book synthesizes material from all the Figure 2.4 frameworks to improve security analysis. Figure 2.5 provides a graphic depiction of the synthesized Security Analysis Critical-Thinking Framework employed throughout this book.

Figure 2.5 Security Analysis Critical-Thinking Framework

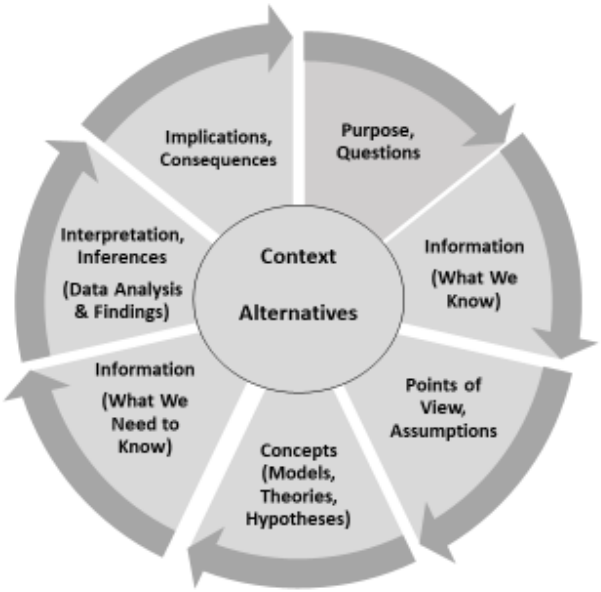

Figure 2.5 places the ten elements-of-thought framework in the order of the steps in the scientific method. Starting with the purpose and questions and moving clockwise around the circle may seem linear as one step follows another. The proper use of the elements is anything but linear! Paul and Elder offer how, in the best critical thinking efforts, the analyst will continually be reconsidering and readdressing all the elements as the overall analysis proceeds.[31] Thus, all the elements are interrelated. Figure 2.5 shows the alternatives and context elements

in an inner circle overlapping the other elements. This is because context and alternatives affect all the other elements directly. For example, an analysis may have alternative purposes and questions, alternative information, alternative points of view and assumptions, etc.; so, the context and alternative elements must be addressed throughout the use of each of the elements. Additionally, Figure 2.5 shows two information elements: what we know and what we need to know. This is consistent with the scientific method for depicting how the initial information search will uncover the existing main facts and theories applying to the questions driving the study; but, as the study develops conceptual models and alternative hypotheses, a continuing search for information usually is required to test those hypotheses. A more detailed coverage of the elements of thought within the Security Analysis Critical-Thinking Framework is provided in following chapters, including the analytic techniques to be employed with each element. Below is a short summary of each element.

Purpose and questions. Every research project or analysis should begin with a broad purpose, which usually is so broad it cannot be studied by itself. For example, it would take years, if not decades, to study a purpose such as "How to establish world peace?" The analyst must narrow the purpose's scope to address specific questions to study within the time and resources available. Developing a good purpose and questions for an analytic project can be challenging. Chapter 4 expands on these elements.

Information and context. Once the question(s) are developed, the next step is to search for both existing information (data, facts, evidence), studies, and theories, pertaining to the current problem. This search takes the form of a skill set entitled **information literacy**, meaning having the abilities to find, assess, use, and document information. Elementary and secondary schools only touch on the skills needed to be truly information literate. During the initial information search, the analyst will find the historical and current information needed to establish the

context of the analysis. A security analyst must have well-developed information literacy skills as explained in Chapter 5. Referring to Figure 2.5, the information element is addressed a second time to generate data needed to test the alternative hypotheses or scenarios developed. This second information-gathering effort may require a deeper search of existing data, or it may include tasking the intelligence collection system as described in Chapter 5.

Points of view and assumptions. With the material gleaned from the initial information search, the analyst assesses the points of view and assumptions at work, which must be assessed not only for opposing actors but also for the analysts themselves. Points of view and assumptions speak to the belief systems of the actors or societies under study; these include ideological, political, economic, social, cultural, religious, and linguistic factors. Knowing the points of view and assumptions of actors is an important part of explaining and predicting the actors' behaviors or decision making. Chapter 6 and Appendixes III provide details.

Conceptualization. The analyst then conceptualizes (models) the behavior of the actors under study. There are a number of modeling techniques described in Chapter 7, including details for geospatial modeling, temporal modeling, process modeling, structural causal modeling, and agency modeling.

Alternatives. Working in conjunction with the conceptualization element, the analyst establishes the range of alternative hypotheses or scenarios for the analysis; i.e., differing options to explain or predict the human behavior or decision making under study or development of differing policy recommendations. There are a number of techniques discussed for generating alternative hypotheses and recommendations in Chapter 8. Some hypotheses and recommendations will flow from the modeling in the conceptualization analysis, and others will flow from a variety of other techniques covered in Chapter 8. This

chapter also addresses how to synthesize **creative thinking** into the critical-thinking framework. Basic creative-thinking techniques are introduced to generate those "out-of-the-box" alternatives, which must be both unique and useful. The creative-thinking alternatives then are tested along with alternatives generated by the conceptualization element and other techniques.

Interpretation and inference. With the alternative hypotheses, scenarios, or policy recommendations generated, the next step is to test each one to determine the best alternatives to answer the questions or solve the problems guiding the analysis. There are a number of qualitative, comparative, and quantitative techniques for testing and evaluating alternative hypotheses, scenarios, and policy recommendations. Chapter 9 covers basic qualitative techniques for interpretation and inference that all security analysts should know. The analytic findings emerge from this element.

Implications and consequences. The findings or best solutions from the analysis must then be evaluated for their implications and consequences. If the findings or solutions are adopted, decision makers need to understand the likely outcomes. Implications flow from thoughts generated by the analysis. Consequences flow from the actions the analysis identifies, and decision makers accept and implement. When considering consequences, they usually are classified in a cascading order, labeled first-order consequences, second-order consequences, and so forth. Chapter 10 investigates the implications and consequences (the "what next" actions) for security analysis. This chapter also includes techniques for intelligence analysts to develop warning analyses and for policy analysts to market their recommendations to customers.

The Security Analysis Critical-Thinking Framework at Work

Box 2.1 presents a critical-thinking analysis of the decision making in the 1962 Cuban Missile Crisis. It shows the Figure 2.5 Security Analysis Critical-Thinking Framework at work. While the elements in Figure 2.5 are not followed in the exact order presented above, the elements help explain the analytic process and decisions made at the highest levels of the U.S. government during the crisis.

Box 2.1 Critical-Thinking Analysis of the 1962 Cuban Missile Crisis[32]

On the morning of October 16, 1962, U.S. President John F. Kennedy was presented evidence of the construction of offensive medium- and intermediate-range nuclear missile launch sites being built on the island of Cuba, just 90 miles from the United States. This disclosure initiated a 13-day crisis, taking the United States closer to nuclear war with the Soviet Union than at any other time during the Cold War. Declassified documents from both the U.S. and Soviet sides of this crisis, memoirs of those involved in the decision making, tape recordings of U.S. meetings, and both historical and decision-making scholarly studies of the crisis, allow an analysis of the decision processes that occurred during those 13 days. This summary analysis looks mainly at how critical thinking by Kennedy and his advisers contributed to the outcome. This military and political crisis provides examples of poor initial U.S. critical thinking, and later, more focused critical thinking on the U.S. side likely prevented a nuclear war.

For several months prior to the fall of 1962, U.S. intelligence was monitoring the shipment of military equipment by the Soviets to the island of Cuba. The Soviets openly stated the military equipment was only defensive in nature. On September 4, 1962, President Kennedy warned the Soviets: “Were it to be otherwise [if offensive military equipment was provided], the gravest issues would arise.” In open and private contacts with U.S. officials, the Soviets insisted the military equipment was solely for the defense of Cuba. It was

determined later that these Soviet assurances were part of a major deception campaign.

As U.S. mid-term elections approached in November 1962, Republican Party politicians excoriated the President and his Democratic Party for being soft on communism. The Republicans criticized the President for inaction regarding Soviet military equipment deliveries to Cuba. Other past events also contributed to the perception Kennedy was weak on security. He was seen as indecisive and weak during the debacle of the April 1961 Bay of Pigs invasion by U.S-backed Cuban exiles. He had been bullied at a June 1961 Vienna summit by Soviet leader Nikita Khrushchev. He also failed to act decisively in August 1961 when the Soviets constructed the Berlin Wall separating East and West Berlin. The confirmation of the Soviet missiles in Cuba became another test of Kennedy's security mettle.

On the afternoon of October 16, 1962, the President took counsel with the National Security Council's Executive Committee (ExCom), a select group of President Kennedy's closest advisers. Discussions that first day were rife with poor thinking. The question before the ExCom: "What do we do about the Soviet missiles in Cuba?" By the end of that first day, the leading recommendations were to conduct surprise surgical airstrikes on Cuban air defenses and Soviet missile sites, followed by an invasion of Cuba. The discussions exhibited extreme Groupthink (Group Conformity Bias) as the more militaristic voices in the ExCom took charge of the conversations to advocate for military action, while others in the ExCom remained largely silent. The recommendations to the immediate problem were reached without sufficient information, using analogies of past Soviet military and political behavior with no supporting background or context, failure to consider a full range of alternatives, and failure to consider the immediate and longer-term consequences of such military attacks. Much of that first day's ExCom deliberations were anchored in System 1 thinking.

After the first day of ExCom meetings, President Kennedy and his brother, Attorney General Robert F. Kennedy, were both uneasy with the recommendations to attack Cuba without first attempting diplomatic or other

less-risky actions. The Kennedy brothers believed they had a few days before the President had to make a decision, as it appeared it would be at least a week before the information on the presence of Soviet missiles in Cuba became public. Moreover, intelligence revealed the missile sites were likely not yet operational. Without the need for an immediate decision, the Kennedy brothers directed what can be seen now as a classic critical-thinking process—a major example of System 2 thinking. First, they changed the **purpose** and **questions** of the ExCom discussions. The new purpose looked to avoid war. The main question became: "How can we remove the missiles in Cuba while avoiding a conventional or nuclear war?" The President knew he had to show personal decision-making strength in this case. He also was worried about how the outcome would affect Berlin. Kennedy feared the Soviets could use the Missile Crisis to militarily seize West Berlin, which was under U.S. and Allied protection. The Kennedys initiated an expanded search for **information** by bringing Department of State's senior Soviet and Cuban specialists into the ExCom deliberations. They commissioned updated intelligence studies on the Soviet military aid to Cuba and on the Cuban political situation. They also increased U-2 and lower-level satellite photoreconnaissance of Cuba. The Kennedys also sought broader perspectives on the crisis by adding former officials from the Republican Eisenhower administration to the ExCom, thus ensuring both Democratic and Republican **points of view**.

With a new purpose and questions, expanded information, and broader perspectives, the ExCom generated a wider range of **alternatives**. The main alternatives included:

1. Do Nothing: Assuming U.S. superiority in nuclear weapons did not change the U.S.-Soviet balance of power.
2. Diplomacy (Soviets): Use diplomatic channels to convince the Soviets to remove the missiles.
3. Diplomacy (Cubans): Tell Cuban leader Fidel Castro to break with the Soviets and not face a U.S. invasion.
4. Naval Blockade: Deploy U.S. and Allied navies to prevent additional offensive military equipment from arriving in Cuba.

5. Air Strikes: Use U.S. Air Force and Navy aircraft to attack Cuban air defenses and Soviet nuclear missile sites.
6. Land Invasion: Order a full land invasion of Cuba to destroy nuclear missile sites and eliminate the Castro Communist government.

ExCom members investigated the **assumptions, consequences**, and ability of the U.S. and Latin American allies to carry out each alternative. At one point, the ExCom broke into two sub-committees to consider separately the most likely alternatives (naval blockade and air strikes). President Kennedy thought through the crisis using two **conceptual lenses**. He first looked at the agency (individual leader's decision making) explanations for why Khrushchev would take the risk of placing missiles in Cuba and how he might react to each alternative. He tried to place himself in Khrushchev's shoes to understand the Soviet actions. In his agency analysis, he also considered the influences of the Soviet Presidium (later Politburo) on Khrushchev's decisions. Kennedy's second lens concerned organizational issues, as he was concerned Soviet or U.S. action might be driven by poor communications or automatic institution of an organizational standard operating procedure, and not due to a leadership decision. He was concerned of the risk of a nuclear war generated by miscalculation on one or both sides. This almost happened when, without Moscow's authorization, a Soviet ground-to-air missile site in Cuba shot down a U.S. U-2, an incident Kennedy ignored as the end of the crisis appeared close.

President Kennedy did not attend all the ExCom meetings because he believed that lower-ranking officials would contribute more to meetings if he was not present. At the meetings without the President, the President's brother was the informal facilitator. Bobby Kennedy did not generally put forward recommended alternatives of his own or relay the President's preferences, but allowed the ExCom to progress with their own ideas. When President Kennedy attended an ExCom meeting, he asked many pointed questions to ensure he fully understood the issues at play (something he did not do in the 1961 Bay of Pigs invasion).

President Kennedy's final decision was a combination of the above alternatives. Taking only 3-4 days to complete its analysis, the secondary ExCom effort resulted in the President's approval of the following actions:

1. Use diplomatic channels and other informal communications to convince the Soviets to remove the missiles.
2. Institute a naval quarantine of Cuba where all inbound offensive military weapons or equipment would be turned around and attempts would be made to convince the Soviets to remove the missiles from Cuba. Defensive military equipment and general trade to Cuba were not interrupted. A combined U.S. and Latin American naval quarantine force was stationed 500 miles from Cuba to allow plenty of decision-making time, on both sides, if a vessel did not stop or would not turn back. The term "quarantine" was used as it seemed less threatening and more limited than a "blockade," which could have been seen as an act of war under international law.
3. If the diplomacy and naval quarantine were not successful in convincing the Soviets to remove the missiles, then a strike on Cuban air defenses and Soviet missile sites would be conducted; followed by a U.S. invasion of Cuba.

After ensuring that he had the support of the U.S.'s closest NATO allies and the Organization of American States, President Kennedy revealed the existence of the Soviet missile sites to the U.S. public on the evening of October 22. He then announced the deployment of the naval quarantine and the need for the Soviets to dismantle the sites and return all missile-related equipment to the Soviet Union.

During the period October 23-29, the ExCom deliberations and diplomacy continued as the United States bargained with the Soviets behind the scenes through formal letters exchanged between Kennedy and Khrushchev. There were also a number of informal communications sent to Khrushchev through other Soviet officials. A main informal communications channel entailed Bobby Kennedy meeting with the Soviet Ambassador in Washington. Later provision of Soviet records on the crisis revealed Khrushchev, while consulting with the

Soviet Presidium, was making all the decisions himself with little other input. Analysis shows Khrushchev's understanding of the situation to be cloudy at best, he worked from haphazard or incorrect information, and his decisions lacked high-quality deliberations—a classic case of System 1 thinking and why President Kennedy so feared the start of a nuclear war due to unintended miscalculations.

In the days before and after Kennedy's October 22 announcement, the United States marshalled military forces to carry out the final alternative of assaulting Cuba. Florida military airbases were filled with attack and fighter aircraft. U.S. aircraft carriers arrived near Cuba, and U.S. Army and Marine Corps forces were mobilized to invade Cuba through both air and amphibious assaults. Additionally, U.S. nuclear forces were placed on high alert, with some targeted on Cuba, but most prepared to make a nuclear assault on the Soviet Union. There was no effort to hide the U.S. military movements and nuclear alerts from the U.S. public or Soviet intelligence collectors.

By late-October, the situation between the Soviets and United States often is characterized as one of being "eyeball-to-eyeball" (a classic Game of Chicken—Chapter 7). Then on October 29, Khrushchev "blinked." He offered to dismantle and return the offensive ballistic missiles to the Soviet Union. He also said the Soviets would remove several nuclear-capable, short-range bombers and tactical nuclear weapons already in Cuba (which the United States did not know were there). Khrushchev made this offer in exchange for U.S. assurances it would not invade Cuba. Khrushchev also wanted the United States to remove intermediate-range nuclear missiles from NATO sites in Turkey and Italy. This was not part of the publicly announced agreement, but Kennedy vowed behind the scenes to remove these now-obsolete missiles within 4-5 months, which he did.

Good critical thinking during the Cuban Missile Crisis avoided nuclear war. During the crisis, Kennedy demonstrated he was a strong leader on security as he showed both backbone and keen decision-making skills during the crisis. The Soviets did not assault Berlin. Kennedy's Democratic Party retained control of both Houses of Congress in the 1962 mid-term elections. Additionally, with both

sides wanting to avoid future nuclear "brinksmanship," a Soviet-U.S. hotline was installed to expedite crisis communications, and later, a Soviet-U.S. nuclear test ban treaty was signed just before President Kennedy's untimely November 1963 assassination. This was the first in a number of future Soviet-U.S. arms control agreements.

Discussion Points

1. If both President Kennedy and Premier Khrushchev had acted on their own or their advisors' System 1 intuitive thinking, what would likely have been the immediate results and longer-term consequences?
2. Where did President Kennedy and his brother learn to structure the analytic process used by the ExCom—what we now call critical thinking?
3. What other biases (from Figure 2.3) do you see that affected both the U.S. and Soviet deliberations in this case?

Key Concepts

Assumptions Analysis
Bias
Creative Problem Solving
Creative Thinking
Critical Thinking
Deductive Approach to Research
Eightfold Path
Elements of Thought
Empiricism
Information Literacy
Inductive Approach to Research
Logic
Rationalism
Satisfice
Scientific Method
Strategic Intelligence Critical Thinking
Structured Analytic Techniques
System 1 (Fast) Thinking
System 2 (Slow) Thinking
Validity

Discussion Points

1. Why have both the academic community and security analysis community (intelligence and policy analysts) resisted the use of critical-thinking frameworks?
2. Briefly explain an international or national current event or past event where critical thinking was not used, but should have been. What critical-thinking elements were missed? What was the outcome?
3. Briefly explain a personal situation where critical thinking was used. What primary critical thinking elements were used? What was the outcome?

Notes

[1] Office of the Director of National Intelligence, "Analytic Transformation, Unleashing the Potential of a Community of Analysts," (Washington, DC: September 2008), 17.

[2] National Association of Colleges and Employers (NACE), "Job Outlooks 2018 Survey," (Bethlehem, PA: NACE, December 11, 2017). http://www.naceweb.org/career-readiness/competencies/employers-rate-career-competencies-new-hire-proficiency/ (accessed June 21, 2018).

[3] Richard Paul and Linda Elder, *Critical Thinking, Tools for Taking Charge of Your Professional and Personal Life,* 2nd ed. (Upper Saddle River, NY: Pearson Education, Inc., 2014), 19.

[4] Ibid, 367.

[5] Ibid, 19.

[6] Ibid.

[7] Modified from Morgan D. Jones, *The Thinker's Toolkit, 14 Powerful Techniques for Problem Solving,* Rev. ed. (New York: Three Rivers Press, 1998), 8-46.

[8] *Webster's Ninth New Collegiate Dictionary* (Springfield, MA: Merriam-Webster Inc., 1991), 147.

[9] Kristan J. Wheaton (seminar presentation at the annual conference of the International Association for Intelligence Education, Erie, PA, July 14-16, 2014).

[10] Jonathan Haber, *Critical Thinking* (Cambridge, MA: The MIT Press, 2020), 29-31.

[11] Daniel Kahneman, *Thinking Fast and Slow* (New York: Farrar, Straus and Giroux, 2011).

[12] This differs from the more popular abstract theory of "Left Brain and Right Brain," which science has refuted as new technology for brain scans shows that, depending on a person's mental activity, both left and right sections of the brain may be engaged.

[13] Robert H. Ennis, *Critical Thinking* (Upper Saddle River, NJ: Prentice Hall, 1996).

[14] Stephen D. Brookfield, *Teaching for Critical Thinking, Tools and Techniques to Help Students Question Their Assumptions*. (Amazon Digital Services, LLC: Wiley (Jossey Bass), 2011).

[15] Gerard J. Puccio, Marie Mance, and Mary C. Murdock, *Creative Leadership, Skills That Drive Change,* 2nd ed. (Thousand Oaks, CA: SAGE, 2011).

[16] Katherine Hibbs Pherson and Randolph H. Pherson, *Critical Thinking for Strategic Intelligence*, 2nd ed. (Thousand Oaks, CA: Sage/CQ Press, 2017).

[17] Not to be confused with the Buddhist "Eightfold Path" to enlightenment.

[18] Eugene Bardach and Eric M. Patashnick, *A Practical Guide for Policy Analysis, The Eightfold Path to More Effective Problem Solving,* 5th ed. (Thousand Oaks, CA: SAGE/CQ Press, 2016).

[19] Paul and Elder.

[20] Gerald M. Nosich, *Learning to Think Things Through, A Guide to Critical Thinking Across the Curriculum,* 4th ed. (Upper Saddle River, NJ: Pearson/Prentice Hall, 2011).

[21] Ennis.

[22] Noel Hendrickson, *Reasoning for Intelligence Analysts, A Multidimensional Approach of Traits, Techniques and Targets* (Lanham, MD: Rowman & Littlefield, 2018).

[23] Gary King, Robert O. Keohane, and Sidney Verba. *Designing Social Inquiry, Scientific Inference in Qualitative Research* (Princeton, NJ: Princeton University Press, 1994).

[24] Brookfield.

[25] Puccio, Mance, and Murdock, 122-126.

[26] Office of the Director of National Intelligence, 17.

[27]The Foundation for Critical Thinking, https://www.criticalthinking.org/ (accessed June 29, 2018).

[28] Paul and Elder.

[29] The Foundation for Critical Thinking.

[30] Nosich.

[31] Paul and Elder, 96-97.

[32] The Cuban Missile Crisis is one of the most studied cases in recent history. The Box 2.1 analysis is a synthesis of several works on this crisis. The main material for this case study comes from Richard E. Neustadt and Ernest R. May, *Thinking in Time, The Uses of History for Decision Makers* (New York: The Free Press, 1986), 1-16; and David T. Moore, *Critical Thinking and Intelligence Analysis* (Washington, DC: National Defense Intelligence Press, 2009), 20-47,

which provides a critical-thinking analysis of the U.S. intelligence community analytic process during the crisis. The best theoretical coverage of the case may be found in Graham Allison and Philip Zelikow, *Essence of Decision, Explaining the Cuban Missile Crisis,* 2nd ed. (New York: Longman, 1999). Also helpful was Robert Smith Thompson, *The Missiles of October, The Declassified Story of John F. Kennedy and the Cuban Missile Crisis* (New York, Simon and Schuster, 1992), which uses declassified U.S. and Soviet material and recreates the dialog and personal interactions among ExCom members and other key personnel during the 13-day crisis.