

CHAPTER 18

COGNITIVE FACTORS IN NATIONAL SECURITY DECISIONMAKING

George E. Teague

Generally, national security professionals would probably agree that decisions concerning our national security are so important that they ought to be above personal and organizational self-interests and reflect an objective, unbiased approach to selecting actions that are truly in the best interest of the nation. However, for a variety of reasons, this is often not the case. A number of decisionmaking models have been developed and examined in order to gain insight into the national security decisionmaking process and to identify those factors that often keep this process from being as objective and unbiased as it perhaps should be. In their book, *Essence of Decision, Explaining the Cuban Missile Crisis*, Graham Allison and Philip Zelikow provide three such models for examining the U.S. national security decisionmaking process.¹ The first of these, the rational actor model, is essentially the ideal decisionmaking process—an unbiased, comprehensive examination of the relevant facts and all potential courses of action leading to an optimal choice designed to maximize value in terms of national interests. Two other models, organizational behavior and governmental politics, address some of the forces at work within our national security system—organizational self-interests, bureaucratic resistance, personal agendas of influential individuals, etc.—that often influence the decisionmaking process and lead to outcomes that would not have been predicted by the rational actor model. Even these models, however, do not fully account for why decisionmakers, at times, pursue courses of action that seem to disregard international and domestic political influences, appear inconsistent with national interests, or otherwise seem to deviate from the rational approach. Nor do they account for how decisionmakers sometimes make “good” decisions in the absence of sufficient time or information to adequately develop a rational approach to the issue.

In order to fully understand national security decisionmaking, then, a fourth model is required—one that takes into account factors that affect **individual** decisionmaking. Since decisions are ultimately made in the minds of individual decisionmakers, even when working as members of a group charged with making a group decision or recommendation (i.e., a jury or committee), it is almost inevitable that those decisions will be influenced to some extent by such things as personal beliefs, biases, values, desires, experiences, and memories. Further, anything that might affect an individual’s ability to function mentally, such as strong emotions, stress, fatigue, and illness, will likely also affect the decisions he or she makes. Finally, since many (most?) significant national security decisions are made under conditions of great uncertainty, how individuals compensate cognitively for the absence of important information will necessarily impact on the information they consider and the decisions they ultimately reach. It is therefore important that national security professionals understand how individuals make decisions and appreciate the influence of cognitive factors on the decisionmaking process.

This chapter will provide only a brief overview of some of the cognitive factors at work in the national security decisionmaking process. Readers who wish to pursue this topic in greater detail will find a wealth of available material.

Cognition and Decisionmaking.

As indicated above, many factors may affect the extremely individual and internal process of making a decision. Some of these represent cognitive processes and tendencies common to most humans, while others are more idiosyncratic. At times these factors can enhance the decisionmaking process, but often they pose significant pitfalls. Failure to recognize these potential problems can lead to ineffective or flawed decisions.

Cognition.

The human mind generally prefers and seeks simplicity, consistency, and stability. The mind dislikes uncertainty and mental discomfort and will routinely attempt to eliminate these aspects from decisionmaking. These tendencies usually enable humans to efficiently sort, process, and make sense of the vast amount of sensory input received on a daily basis. However, when confronted with the complexities inherent in most decisionmaking situations, these same tendencies may lead one to ignore some information, “fill in the blanks” with other information from memory, and rely on unconscious mental shortcuts or routines known as heuristics (“rules of thumb”).² For example, although most people wish to believe that they mentally examine every alternative before choosing the “best” one, this is normally not so. The human mind tends to “satisfice,” that is, to seize upon the first solution that appears to solve the problem without looking past that solution to see if a better one can be found. Decisionmakers must consciously force themselves to identify and evaluate all possible solutions if the optimal solution, versus one that is only “good enough,” is desired. This is easier said than done, particularly when the stakes are high and the decision must be made under conditions of limited time and/or limited availability of relevant information. Such conditions increase the likelihood that decisionmakers will rely on assumptions and heuristics.

Although heuristics generally serve to facilitate mental functioning, researchers have identified a number of flaws in the way minds work when making decisions.³ Several of these are addressed below:

Anchoring. During decisionmaking, the mind tends to give disproportionate weight to the first information it receives. This information, such as first impressions or initial estimates, “anchors” subsequent thoughts and judgements. Since anchors can set the terms on which a decision is made, negotiators often try to exploit this tendency by submitting initial proposals that anchor negotiations in their favor (e.g., high-end offers).

Status Quo. Decisionmakers display a strong bias toward solutions that maintain or perpetuate the status quo. Breaking from the status quo requires taking increased action and responsibility and opens the possibility of criticism and regret. For example, the UN continued to impose economic sanctions against Iraq for years, despite evidence that the sanctions were being violated and having little effect on Hussein’s regime. The other options, lifting the sanctions altogether or using force to enforce them, were viewed as too risky for many members of the Security Council. Despite considerable criticism, President Bush broke from the status quo, and it remains to be seen whether or not he or his allies experience serious regret.

Sunk Cost. Decisionmakers tend to make choices that justify past choices, even when they no longer seem valid. People are generally unwilling to admit to mistakes, especially when the cost for doing so is high. Some might argue that President Johnson’s unwillingness to withdraw from, or change his method of prosecuting the Vietnam War was due in large part to sunk cost—his political commitment and the potential cost for admitting that he was wrong were too high.

Confirming Evidence. Decisionmakers seek out information that supports their existing point of view while ignoring or dismissing contradictory information. This is compounded by two other tendencies: to subconsciously decide what we want to do before we figure out why we want to do it; and, to be more

engaged by things we like than by things we dislike. Current debates over the accuracy and use of various intelligence reports on Iraqi weapons of mass destruction programs suggest that members of the Bush administration may have been affected by this bias towards confirming evidence to support a course of action they had already decided upon. At a more personal level, people often decide that they want a particular type of car, then seek information that supports their choice while ignoring or dismissing information that points out reasons not to buy the car (poor safety record, high insurance costs) or to buy a different model (higher fuel efficiency, lower cost).

Framing. The way a problem is framed can strongly influence the decision that is made. Framing can establish the status quo, introduce an anchor, highlight sunk costs, or lead one towards confirming evidence. Further, people tend to accept the frame as it is presented to them rather than restating the problem in their own terms. When framed in terms of potential gains, a given option is more likely to be chosen than when framed in terms of potential costs or losses. For example, surveys of public opinion concerning development of a missile defense system indicate that, when asked if having such a system to protect against missile attacks from rogue states is a good idea, most people respond favorably. However, when asked a similar question that highlights the cost in billions of dollars, the response is far less favorable. When debating whether to spend this much money on research and development of the system, opponents generally frame the problem in terms of the low likelihood of attack and of other programs where the money could be better spent, whereas proponents of the system highlight the costs associated with failure to prevent an attack (how much is your hometown worth?).

Overconfidence. Although most people are not very good at making estimates or forecasts, we tend to be overconfident about our accuracy when doing so, which can lead to poor judgement and bad decisions. This overconfidence can lead decisionmakers to limit the range of possibilities and miss opportunities or expose themselves or others to too much risk. Many critics of the postwar operations in Iraq accuse members of the Bush administration of being overconfident in their estimates of how many troops would be needed and how quickly they would be able to withdraw.

Overcautiousness (Prudence). When the stakes are high, we tend to adjust our estimates “just to be on the safe side.” This tendency sometimes leads to “worst-case analysis,” when efforts to cover every possible circumstance can add huge costs in terms of time and resources with minimal, if any, practical benefit. This is particularly evident in the development of weapon systems; engineers are routinely required to design weapons to operate under the worst possible circumstances, leading to huge costs increases despite the low likelihood of ever facing those circumstances.

Availability. Anything that distorts the ability to recall events in a balanced way will distort probability assessments. People tend to be overly influenced by dramatic events that leave strong impressions on their memories. As a result, we tend to exaggerate the probability of events that get disproportionate media attention or that we personally experience, such as plane crashes or the loss of a loved one to a particular disease. For example, if asked to estimate the percentage of sexual assault charges against U.S. servicemen in Okinawa relative to charges against Japanese men, it is likely that more people would assign a higher probability to U.S. servicemen because of attention given to recent high-profile incidents.

Memory.

People acquire data through one or more of the five human senses, and the mind must interpret, evaluate, sort and store this data, as well as determine what is useful and what is not. Generally speaking the mind sorts data into broad categories (schemas) and encodes it for recall.⁴ Entire sets of data may then be retrieved when only limited bits of information are received. For example, if a person hears a growl coming from behind a fence, that piece of information could lead to the identification of the source of the growl as a

dog. The mental picture associated with “dog” may be a generic one, or, if the growl is similar to one experienced in the person’s past, the mental picture may be of a specific type of dog. As more information becomes available the mental picture becomes more complete. If, a few seconds after hearing the growl, the observer noted an open gate, heard the sound of a chain breaking, and the growl were replaced by a fast-approaching, angry barking, a very complete mental picture could be obtained—and several possible courses of action suggested.

This ability to retrieve large amounts of information in response to selected information cues rests in large part on the use of stereotypes. There has been extensive research on this facet of human thought, leading to the general conclusions that stereotyping is “widely practiced as a means of simplifying the world and making perceptual and cognitive processes more efficient” and is “a pervasive human tendency.” Simply stated, stereotypes are used in most aspects of human thought because they offer an easy way of organizing, storing and recalling data. They serve as a tool for simplifying environmental stimuli.⁵ Unfortunately, stereotypes are often developed with inaccurate information and/or applied inappropriately due to insufficient information. Such stereotyping is often the basis of discrimination and faulty decisionmaking due to misinterpreting or underestimating the intentions and capabilities of others. Many would argue, for example, that the United States grossly underestimated both the North Koreans and the North Vietnamese in part because of a widely-held stereotype of Asians as inferior to Westerners. Further, the use of some stereotypic identifiers, such as “terrorist,” “fanatic,” “racist,” or “hero,” may often trigger strong emotional reactions from both the labeled individuals and those who interact with them.

Perceptions.

Perceptions (how individuals interpret and understand data presented to them) are among the most important influences in decisionmaking. The decisionmaker’s perceptions of other actors involved in the decision, the perceived consequences of the decision, and the apparent utility of historical parallels, can come to dominate the decisionmaking process. In extreme cases, perceptions can be so strong that the decisionmaker will ignore some facts, twist others, and interpret data as pointing to the presence of trends that do not exist in reality.⁶

Once formed, perceptions are difficult to discard.⁷ A famous example involves an experiment in which two different groups were shown an identical tape of a college lecture. The first group was told that the lecturer was warm, humorous, and highly respected. The lecturer was described to the second group as harsh, cold, and reserved. After watching the identical lecture, the groups were asked for their impressions. The first group gave the lecturer a very positive endorsement, while the second group was extremely negative in its response.

Analogies and perceptions are closely linked. As the noted behavioral political scientist Robert Jervis states: “Previous international events present the statesman with a range of imaginable situations and allow him to detect patterns and causal links that help him understand his world.” It is human nature to look for patterns in an event, to seek similarities between what is happening now and what has happened before. Once apparent similarities are discovered, an analogy will inevitably be invoked. Examples of such analogies include “Saddam Hussein is just like Hitler,” or “Haiti is another Somalia waiting to happen.” The analogy may then suggest a course of action, e.g., “Appeasement is out, it leads to greater conflict,” or “The United States can never allow the United Nations to take operational command of U.S. forces.” This mental technique can be extremely useful if the analogy is accurate and its use leads to the quick adoption of a successful course of action. Unfortunately, analogies—especially those that are invoked with little or no thought—are rarely accurate, and solutions based on false analogies can be devastating.⁸

Values and Beliefs.

Personal values and beliefs tend to be forged over time and may reflect the cumulative values and beliefs of one's parents, teachers, community, etc. They are powerful influences on decisionmaking and are directly tied to how individuals perceive situations, other people, and actions. People will tend to reject and distrust data or solutions that seem in conflict with their belief and value systems, while embracing those that do.⁹ Of course, the danger is that simply because information runs contrary to a belief, this does not make the information invalid, and vice-versa. For example, in 1941, many senior leaders in the United States believed the Japanese could not mount a surprise attack on the Hawaiian Islands. These leaders knew the Japanese possessed modern aircraft carriers and planes, and a Pearl Harbor scenario had been wargamed. However, these leaders believed that no one could sail a fleet in secrecy across the Pacific Ocean. They also believed that when the Japanese did start a war, they would limit their attacks to the Philippines, Guam, and other targets closer to Japan. These beliefs, although sincere, did not prevent the air raid on December 7, 1941. The leaders' beliefs caused them to discard, ignore or dismiss multiple indications that the Japanese were quite capable of mounting such an attack.

A decisionmaker may also tend to believe that his or her personal value and belief systems are universal when they may not be. This can lead to "mirror imaging," i.e., a decisionmaker expecting the "opponent" to react exactly as he/she would, or attributing motives to an opponent's action based on why he/she may have done the same thing. Similar to the pitfalls of stereotyping, when a decisionmaker substitutes his or her own beliefs or values to compensate for a lack of information about—or understanding of—others involved in a national security issue, the likely result will be a poor decision.

Finally, decisionmakers may feel compelled to select a particular course of action based on their personal beliefs and values regardless of international or domestic political pressures. Sometimes our leaders simply believe that a particular action is the right or wrong thing to do and they act accordingly. President Bush, for example, appears to be firmly committed to development of a missile defense despite widespread international and domestic opposition and doubts about its efficacy.

Emotions, Fatigue and Stress.

The tendency of the mind to simplify and satisfice tends to be exaggerated when accompanied by strong emotions, fatigue, or stress. Emotions trigger chemical changes in the body that are generated in the same areas of the brain that handle reasoning and decisionmaking.¹⁰ As a result, strong emotions may physically interfere with normal cognitive processing of information during the decisionmaking process, despite one's attempts to ignore or control them. In addition, emotions such as anger, embarrassment, and sadness may cause the decisionmaker to deliberately ignore the advice of others and make decisions for personal reasons rather than out of concern for national interests. However, not all emotions are bad—for example, the presence of fear may cause the decisionmaker to more carefully consider the potential consequences of high-risk courses of action in situations where the stakes are high. The challenge facing a decisionmaker is to recognize emotional influences without being ruled by them.

The importance of proper physical condition in regards to decisionmaking should be readily apparent to anyone who has attempted some complex task after a long and tiring day. Fatigue decreases sensory awareness, limiting the ability to receive sensory data, and it inhibits cortical activity in the brain, limiting the ability to accurately interpret and then process the information. In other words, the senses do not collect information as well, and the mind is prone to misperception and inefficient processing of the information. People become more likely to misunderstand what they see or hear, to overlook or ignore important information, and to make faulty decisions as a result. Under these conditions, even something as simple as filling out a crossword puzzle may prove impossible. However, given a few hours rest, the same puzzle may

be solved in minutes. Sleep deprivation induces extreme fatigue and exacerbates the cognitive limitations described above. Military leaders routinely deny themselves adequate rest during high-stress training and combat operations, often leading to impaired decisionmaking that results in catastrophic operational failure, fratricide and accidental deaths, blind obedience to irrational or illegal orders, and otherwise preventable noncombatant casualties.¹¹

Stress is also frequently encountered during the decisionmaking process and deserves special mention. Stress can lead to an increase of satisficing decisions and may strengthen the tendency to unquestioningly accept as accurate pre-existing perceptions, values, and beliefs. Stress can also lead to irritability, anger, and an unwillingness to listen to others. If a team, such as a committee of advisors, is involved with the decision, a high level of stress can rapidly cause dysfunctional and ineffective behavior, such as bickering and emotional outbursts. This is especially true if the team is inexperienced in dealing with stressful situations and becomes even worse if the members of the team are not used to working with each other.¹²

Personality and Motivation.

An individual's personality and personal motivation will also play a role in the decisionmaking process. Imagine the effect a cynical, autocratic and arrogant decisionmaker would exert on the decisionmaking process, compared to that exerted by an outgoing, affable and optimistic decisionmaker. The former could easily stifle opinion, instill fear and dislike, and perhaps convince others that the situation was hopeless. The latter's personality would very likely encourage subordinates to offer suggestions, feel comfortable in providing information, and keep belief in success alive. Some decisionmakers are brusque, while others are personable. No specific personality type is "wrong," but each affects decisions. Prudent decisionmakers will understand not only their own personalities, but also those of their closest advisors.

Motivation is also a factor in decisionmaking. A leader who wants a particular decision outcome will be less likely to turn over the process to subordinates. There will be less chance of stalling or delaying tactics. Conversely, a low level of motivation may mean that subordinates obtain an even greater degree of control over the decision or that the decision is continually put off—sometimes, as in Haiti, until it becomes a crisis. The perceived consequences of a decision may directly affect the decisionmaker's level of motivation and the extent to which he or she works for a particular decision. Concerns over such issues as popularity polls, reelection, impeachment, or one's legacy may cause decisionmakers to take actions that they otherwise might not have or that would not have been predicted by the rational actor model. Some might argue, for example, that concerns over possible impeachment compelled former President Kennedy to take aggressive action in the Cuban missile crisis.

Groupthink.

Groups of people sometimes appear to take on particular identities that arise through the complicity of the group's members and then behave in ways that can have a profound impact on decisionmaking. Behavioral expert Irving L. Janis developed a theory regarding this behavior and labeled it "Groupthink." Typically, as the group identity emerges members begin to modify their own behaviors in order to conform. Eventually, members may become reluctant to offer any opinions that may be seen as "anti-group." Those that do may find themselves being pressured to return to group norms and ostracized if they fail to do so.¹³ When this occurs, recommendations from the group may be based more on maintaining group harmony than in truly addressing the problem. Many believe that President Kennedy's advisors exhibited signs of groupthink in developing their recommendations that led to the disastrous Bay of Pigs invasion.

Removing Barriers To Clear Thinking.

Having identified potential problems with cognition and decisionmaking, it is appropriate to examine potential methods to reduce or eliminate those problems. These methods include:

Seek Contradictory Views. Decisionmakers must guard against hearing only one point of view. When this occurs, unseen biases can intrude into the decisionmaking process. If one organization or individual assumes a disproportionate role in advising the decisionmaker, opposing views might not be heard or considered. Expanding the diversity of views makes the potential influence of biases less likely.¹⁴ The more varied the backgrounds and perspectives of those offering the leader advice, the less likely an important factor will go unnoticed.

Use Multiple Advisory Groups. Although assigning two groups to work separately on the same issue is redundant, this method may ensure that a wider spectrum of alternatives is examined prior to reaching a decision.¹⁵ During the Cold War, the U.S. military carried this process further than most other organizations. Not only were multiple independent groups assigned to large problems, but elite groups of specialists were also trained to look at issues from a Soviet perspective. This technique had the added benefit of reducing the danger of “mirror imaging,” as long as the “red” players did not actually “think blue.”

Assign a Devil’s Advocate. This can be a highly effective technique, as was demonstrated during the Cuban Missile crisis when U.S. Attorney General Robert Kennedy filled the (unofficial) role of Devil’s Advocate. Briefly stated, the role of the devil’s advocate is to examine critically other proposals being put forward. This acts as a hedge against biases and groupthink. However, care must be taken in selecting the person to fill this role. This individual must be strong enough to take the mental stress of always being in the opposition and be respected enough by the leader to ensure that the advocate’s opinion is not simply ignored. The latter happened during the administration of President Lyndon Johnson. Presidential advisor George Ball filled the devil’s advocate role in discussions about Vietnam policy, but his opposing positions grew irritating to the president. Over time the other presidential advisors began to ignore Ball. This was doubly unfortunate because the group continued to believe that the devil’s advocate was keeping them safe from groupthink biases.¹⁶

Identify Known/Unclear/Presumed. In their book, *Thinking in Time*, political science experts Richard Neustadt and Ernest May offer several methods to avoid the traps inherent in using history as a tool in decisionmaking. One of these methods consists of formally writing down what is actually known, unknown, and presumed about the situation and the actors involved in it. This relatively simple exercise may point out potentially dangerous assumptions and blind spots. It can also be used to channel intelligence efforts and resources into activities with the largest potential payoffs.¹⁷

Identify Similarities/Differences. Neustadt and May also suggest treating analogies with great care. Recognizing the tremendous allure of an analogy (providing a blueprint for a solution) they strongly recommend that a list identifying the similarities and differences between the current and past situation be compiled. When this is done, it is not uncommon to find the similarities were only superficial or did not even exist at all.¹⁸

Conduct Placement. Neustadt and May offer a third safeguard known as “placement.” Placement is a method by which the stereotypical view of an opponent becomes more factual and sophisticated as important elements of personality and individual history are identified and placed in historical context. Although not in any way presented as a crystal ball or as a key to predicting exact behavior, placement does seem to offer a better chance of predicting an adversary’s moves and understanding how an opponent thinks.

Avoid Stress and Fatigue. The old folk remedy of sufficient rest being a cure for ailments still applies. Leaders must watch their staffs for signs of excessive fatigue and should schedule and manage meetings and work sessions to ensure that each member of the team can contribute at his/her maximum potential. At the same time, someone must watch the leader. Practicing decisionmaking, preferably under simulated crisis conditions, is a fairly effective method to prepare for, and minimize, the potential effects of stress in an actual crisis.¹⁹

Delay the Decision. Although not always possible, there may be real merit in postponing the execution of a decision until enough time has passed to allow reassessment. This technique reduces the chance that emotion might play too large a role in the decision.

Safeguard Against Groupthink. Janis discusses several safeguards in detail in his book *Groupthink*. These include encouraging the discussion of diverse opinions, accepting criticisms and attempting to shed organizational biases. Janis points to the Cuban Missile Crisis and the creation of the Marshall Plan as two instances where these techniques were extremely successful. A strong devil's advocate was involved in decisionmaking during the Cuban Missile Crisis, and the authors of the Marshall Plan solicited advice and input from an incredibly diverse group of experts. Janis also notes that, although the techniques sound easy, they may not be easy to implement. Senior leaders are often unprepared to hear their own judgments criticized, and many have difficulty remaining objective and impartial in this process. They are generally used to being right, they often have more experience than anyone around them, and they may perceive criticism as a personal attack.

Establish Reexamination Criteria. Despite the most conscientious intentions to remain "rational," perceptions may gain control of the decisionmaker and his/her key advisors. It is therefore useful, at an early stage of the decisionmaking process, to identify specific criteria that will trigger a reexamination of some or all presumptions.²⁰ Examples could include the spotting of a new behavior or technology on the part of the opponent, or the lack of an expected reaction to certain actions. For example, the Egyptian acquisition of improved air defense systems and long-range missiles from the Soviet Union should have triggered a reexamination of the Israeli assumption that the Arab nations would not attack until the Egyptians had rebuilt their air force to address their air superiority deficiency. Had such criteria been adopted, the 1973 Arab-Israeli conflict might have run a very different course.

Conclusion.

The human dimension in decisionmaking is inescapable. It applies to all decisionmakers, irrespective of culture, education, or background. Everyone uses stereotypes to aid in memory retrieval, selects analogies to help in decisionmaking, and is affected, sometimes deeply, by personal beliefs, values, and emotions. In order to achieve a more complete understanding of the national security decisionmaking process, it is therefore important to consider the wide range of cognitive factors that may affect the individual decisionmaker. It is equally important to take steps to safeguard against the potentially detrimental effects of these cognitive factors when national security decisions are being made. In a general way, this reading has sought to indicate how this might be accomplished.

Notes - Chapter 18

- 1 Graham Allison and Philip Zelikow, *Essence of Decision, Explaining the Cuban Missile Crisis* (New York: Addison-Wesley Educational Publishers, 1999).
- 2 John S. Hammond, Ralph L. Keeney, and Howard Raiffa, "The Hidden Traps in Decisionmaking," *Harvard Business Review* (September-October 1998), 47.
- 3 Ibid., 47-56.
- 4 John R. Anderson, *Cognitive Psychology and Its Implications* (San Francisco: W. H. Freeman and Company, 1980), especially chapters 1,4,6,8,11.
- 5 Allport cited in Taylor Cox, Jr., ed., *Cultural Diversity in Organizations* (San Francisco: Barret-Koehler Publishers, Inc., 1993), 88-89.
- 6 Richard K. Betts, *Surprise Attack* (Washington, DC: The Brookings Institute, 1982), 126.
- 7 Robert Jervis, "Hypotheses on Misperception," *World Politics*, Vol. 20, No. 3 (April 1968), 460.
- 8 *Webster's Ninth Collegiate Dictionary* (Springfield: Merriam-Webster Inc., 1985) defines "analogy" as: "The inference that if two or more things agree with each other in some respects, they will probably agree with each other in others." Robert Jervis, *Perception and Misperception in International Politics* (Princeton NJ: Princeton University Press, 1976), 217; Richard E. Neustadt and Ernest R. May, *Thinking in Time: The Uses of History for Decisionmakers* (New York: The Free Press, 1986), 36.
- 9 Jervis (1968), 456; Jervis (1976), 229.
- 10 Sandra Blakeslee, "Tracing the Brain's Pathways for Linking Emotion and Reason," *The New York Times*, 6 December, 1994, C1.
- 11 Jonathan Shay, "Ethical Standing for Commander Self-Care: The Need for Sleep," *Parameters* (U.S. Army War College, Summer 1998) 93-105.
- 12 This information is supported by data obtained from the Tactical Decisionmaking Under Stress (TADMUS) Investigation being carried out by ALPHATECH, INC. of Burlington, MA on behalf of the Naval Air Warfare Center. The TADMUS study is designed to evaluate the effect of stress in the extremely fast paced, highly technology dependent environment of modern naval warfare. The decision to conduct this study was made following the destruction of an Iranian airliner in July 1988 by the USS *Vincennes*, a United States Navy cruiser then on patrol in the Persian Gulf.
- 13 Irving L. Janis, *Groupthink* (Boston: Houghton-Mifflin Company, 1982), 2-13.
- 14 Jervis (1976), 271.
- 15 Ibid., 275-276.
- 16 Allan R. Ricketts and Richard J. Norton, eds. *National Security Case Studies in Policy Making and Implementation* (Newport: Naval War College Press, 1994), 216; Jervis (1968), 416; Janis, 275.
- 17 Neustadt and May, 34-57.
- 18 Ibid.
- 19 TADMUS study.
- 20 Jervis (1968), 463; and Neustadt and May, 274.

