A basic understanding of nuclear deterrence is necessary to inform decisions on the proper role of nuclear weapons in any future U.S. defense strategy. The movie *Dr. Strangelove* is an intellectual masterpiece that transcends the time in which it was made and provides everything you need to know about deterrence in just 90 minutes. As such, the film offers an effective and accessible mechanism for learning and teaching about nuclear deterrence. In the following, I lay out the key concepts of deterrence and then demonstrate how these concepts are skillfully illustrated in the movie *Dr. Strangelove*. 

**Background**

*Dr. Strangelove* was released in 1964 in the wake of the Cuban missile crisis between the Soviet Union and the United States when fear about nuclear threats first became part of the American consciousness. This fear was increasingly reflected in pop culture novels and thrillers about nuclear weapons. Hollywood film director, Stanley Kubrick wanted to make a thriller about a nuclear accident to capitalize on this fear. Initially, he set out to create a nightmare comedy. However, he found that there was so much about deterrence that was either absurd or paradoxical, he went with a black comedy instead.

In his research for the film, Kubrick read an article by Thomas Schelling, who later became one of the foremost thinkers on deterrence during the Cold War. The article was entitled "Meteors, Mischief and War" published in *Bulletin of Atomic Scientists* in 1960. It reviewed several books written about the dangers of nuclear war including a 1958 novel entitled *Red Alert* written by Peter George. The book had made quite an impression on Schelling. Allegedly, he purchased and gave away dozens of copies to his colleagues. Among others, every member of the Pentagon’s Scientific Advisory Committee for Ballistic Missiles received a copy. After reading the book himself, Kubrick called up the publishers of *Red Alert* and got in touch with the author, Peter George. Kubrick, Schelling and Peter George sat down for an afternoon to discuss how to make the movie after which Kubrick quickly bought the rights to the book.

Kubrick also read *On Thermonuclear War* by Herman Kahn, another now famous deterrence thinker, and met with Kahn, then a well-known military strategist, several times to discuss his film and the inner workings of nuclear strategy. In fact, Kubrick borrowed the concept of a “doomsday machine” from Kahn in order to bring the story in the movie to its grisly end. Kubrick also appeared to have modeled one of his main characters, Dr. Strangelove, on Herman Kahn. In the film, we learn that Dr. Strangelove works for the Bland Corporation, while Herman Kahn worked for the Rand Corporation.
Another movie about nuclear weapons and deterrence, *Fail Safe*, was released the same year as *Dr. Strangelove* and based on a 1962 novel by the same title. Both movies were produced by Columbia Pictures in 1964. Director Stanley Kubrick insisted the studio release his movie first (in January 1964) and got his way. *Fail Safe* was released eight months later.

Interestingly, the Air Force felt compelled to respond to both movies with a documentary film of its own, entitled *SAC Command Post*. The documentary was intended to reassure the public about Presidential command and control over U.S. nuclear weapons and provided a thorough overview of the command and control systems for U.S. bomber bases and missile silos. The movie was never used to educate the public and can now be found on the National Security Archive Web site sponsored by George Washington University.

**What is Deterrence?**

Deterrence is best understood both as a theoretical concept and an actionable strategy. Since deterrence does not involve the actual “use” of military power, but rather the threat of use, it occurs largely in the abstract—i.e., in the minds of the “deterer” and the “deterree”—and therefore, deterrence lends itself rather well to theory.

Although the term itself was first used during the nuclear age, deterrence is not a new theoretical concept. Niccolo Machiavelli emphasized using a “show of force” to persuade enemies that the cost of war would be too high. Deterrence theory was further refined during the Cold War in the context of the threat of nuclear war between the United States and the Soviet Union. The body of literature from the Cold War period is quite extensive and requires significant time to master.

Deterrence resides not only in the theoretical realm, but it is also put into practice as part of a strategy. Throughout the Cold War, deterrence served as the primary element of U.S. national security strategy. Policymakers and military leaders developed actionable strategies—linking alternative courses of action (ways) and instruments (means) to policy goals (ends) to achieve successful deterrence and engaged in contingency planning in the event that deterrence should fail.

*Dr. Strangelove* captures the inherent tension between deterrence as a theoretical concept and a strategy. As a concept, deterrence works out rather simply and effectively in our heads. If there is no war, then we know that deterrence has succeeded. However, when implemented as a military strategy, the tangible actions, planning, the development of military capabilities, and demonstrations of commitment required for deterrence lead to absurd situations that rely upon key assumptions. If those key assumptions fail, then deterrence does not work as intended and mutual assured destruction will likely occur.

There are many definitions for deterrence, ranging from broad definitions (beyond nuclear) to more narrow formulations based on the concept of nuclear deterrence during the Cold War. In the movie, the character Dr. Strangelove offers the most succinct definition of deterrence: it is the art of producing in the mind of the enemy...the fear to attack" (55:09). In essence, deterrence involves influencing the decision-making process and cost/benefit calculations of opponents. By making war too costly relative to its benefits, opponents are deterred from taking such actions.

**Key Components of Deterrence**

The key components of deterrence are rationality, credibility, perception, communication and technology. Deterrence fails if there is a major problem with any of these components.

**Rationality**

First and foremost, the concept of deterrence rests on the assumption of rationality—i.e., the idea that policymakers systematically evaluate the costs and benefits of multiple courses of action and refrain from war if it proves to be too costly. Critics of deterrence often warn about the dangers of assuming rationality on the part of decision-makers. Even if leaders are rational in the purest sense, they often lack necessary information to properly analyze the costs and benefits for all possible courses of action leading to miscalculations.
Moreover, rationality should not be confused with the notion of “reasonability”.¹ The practice of rational decision-making does not mean that we will find the choices of our opponents to be reasonable, that is “based on some shared or understood set of values and standards.”² Our opponents may place great value on things that have no value to us. To determine what courses of action might be rational from the point of view of our opponents, we must therefore get into their heads and see the world from their perspective. If we miscalculate the cost/benefit calculation of our opponent, then deterrence may fail. If our opponent is not rational, i.e., he or she is willing to go to war when the costs exceed the benefits, deterrence may fail.

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² *Dr. Strangelove* The movie begins with a commander of a U.S. Air Force Base, General Jack D. Ripper, asking his military assistant to send the code for "Attack Plan R" to the B-52 bombers under his control.

When General Ripper is questioned by British Group Captain Lionel Mandrake, he makes a seemingly rational argument. General Ripper claims that the Communists are poisoning the entire U.S. water supply with flouride and jeopardizing survival of the American people. He argues that the only way to counter this evil plot was to wipe out the Communists from the planet with an all-out surprise nuclear attack. A surprise attack taking out most if not all of Soviet bomber would minimize American casualties and save the U.S. from being poisoned.

The movie *Dr. Strangelove* vividly demonstrates the risk of relying upon the assumption of rationality to prevent nuclear war. What we consider rational may not be perceived as reasonable by someone else. Indeed, a brief exchange between President Muffley and General Turgidson demonstrates this tension.

³ *President Muffley:* "There's nothing to figure out General Turgidson. This man is obviously a psychotic." (32:39)

⁴ *General Turgidson:* "Well, I'd like to hold off judgment on a thing like that, sir, until all the facts are in.

⁵ *President Muffley:* "General Turgidson, when you instituted the human reliability tests, you assured me there was no possibility of such a thing ever occurring."

⁶ *General Turgidson:* "Well I don't think it's quite fair to condemn a whole program because of a single slip up sir."

Dr. Strangelove also shows the absurd side of rationality and nuclear weapons in the discussion between President Muffley and General Turgidson about how best to respond to the situation created by General Ripper. Since they cannot call back the bombers, General Turgidson recommends to the President that he consider a surprise attack against the Soviets...
and suggests that the U.S. would suffer only "modest and acceptable" civilian casualties from their remaining force. This is presented as the most rational response for several reasons.

**General Turgidson:** "One, our hopes for recalling the 843rd bomb wing are quickly being reduced to a very low order of probability. Two, in less than fifteen minutes from now the Russkies will be making radar contact with the planes. Three, when the do, they are going to go absolutely ape, and they're gonna strike back with everything they've got. Four, if prior to this time, we have done nothing further to suppress their retaliatory capabilities, we will suffer virtual annihilation. Now, five, if on the other hand, we were to immediately launch an all out and coordinated attack on all their airfields and missile bases we'd stand a damn good chance of catching them with their pants down. Hell, we got a five to one missile superiority as it is. We could easily assign three missiles to every target, and still have a very effective reserve force for any other contingency. Now, six, an unofficial study which we undertook of this eventuality, indicated that we would destroy ninety percent of their nuclear capabilities. We would therefore prevail, and suffer only modest and acceptable civilian casualties from their remaining force which would be badly damaged and uncoordinated...Mr. President, I'm not saying we wouldn't get our hair mussed. But I do say...no more than ten to twenty million killed, tops. Uh... depending on the breaks." (36:02)

The suggestion by General Turgidson to strike first is an eerie reflection of reality during the Cuban missile crisis. Several military and civilian advisors including Air Force General Curtis LeMay recommended the same action to President Kennedy as a response to the Soviet placement of missiles in Cuba. These discussions are depicted in the movie, *Thirteen Days* released in 2000.

### Credibility

To speak of deterrence, we cannot avoid considering the issue of **credibility**. Whereas rationality rests on an understanding of the cost/benefit calculation of our opponent (the deteree), credibility depends on our own cost/benefit calculation (the deterer) as perceived by our opponent. In essence credibility is the perceived will to use any instrument of power available and the effectiveness of that instrument. In terms of capabilities needed for deterrence, states do not have to possess the capacity to defeat their opponent, but rather must simply possess practical and politically feasible military options to ensure a credible deterrent, i.e., to make war sufficiently costly.

The level of credibility varies depending on the course of action to be deterred. For example, the threat of nuclear retaliation is likely to be more credible in response to an attack on one's own territory than to a minor conventional attack. If the threat to use force or another type of sanction lacks credibility in the eyes of an opponent, deterrence is likely to fail.

**Dr. Strangelove**

General Ripper activates plan R, which orders the B-52 bomber commanders to proceed to their designated targets and hit them with nuclear weapons. Plan R presumes that there has been a surprise attack against Washington, preventing the President from being able to order retaliation. In the event of such emergency, Plan R pre-delegates the use of nuclear weapons to lower level field commanders in order to ensure prompt retaliation. This was critical for the credibility of deterrence as it served to ensure effective command and control and to deter a surprise decapitating attack by the Soviet Union on Washington, D.C.

**General Turgidson:** "The idea was for plan R to be a sort of retaliatory safeguard." (29:00)

**President Muffley:** "A safeguard?"

**General Turgidson:** "I admit the human element seems to have failed us here. But the idea was to discourage the Russkies from any hope that they could knock out Washington, and yourself, sir, as part of a general sneak attack, and escape retaliation because of lack of proper command and control."

As absurd as it seems, creating a situation in which the loss of centralized command and control could occur was an effective strategy for achieving credibility. If your opponent doesn’t know who controls the weapons (President or lower level commanders) and under what circumstances they might be used, they may be deterred from a surprise attack. Schelling referred to this strategy as the threat that leaves something to chance.

However, the strategy of decentralizing command and control involves significant risk. While ensuring credibility of retaliation on one hand, plan R jeopardizes deterrence on the other because it presumes rationality on the part of all lower
level commanders. And clearly, General Ripper was more paranoid than rational.

Automated retaliation represents an alternative strategy for ensuring credibility. During the Cold War, it was understood that the use of nuclear weapons would most likely lead to mutual assured destruction (MAD) or mutual suicide. Given this horrific outcome, it was by no means certain that the young officers stationed at silos in the United States and the Soviet Union, who were responsible for launching intercontinental ballistic missiles (ICBMs), would flip the switch when it came time to do so.

In fact, during NATO’s Operation Able Archer exercise in 1983, when the Soviet Union was on heightened alert, a Soviet officer choose not to send report when an early warning system detected five incoming U.S. missiles. Instead, he went against the protocol that would have likely led to the launch of Soviet ICBMs in retaliation against the United States. Somehow, the Soviet officer convinced his superiors that it was a false alarm. And indeed it was. The false alarm was caused by a malfunction of the satellite, which interpreted the reflection of the sun off high clouds as a missile launch. This story was recently made into a film entitled The Man Who Saved the World (2014).

Nonetheless, had the warning not been a false alarm, then “human meddling” would have led to the annihilation of the Soviet Union. It is an extremely difficult task to make credible the choice by humans in favor of mutual suicide. The only way to ensure retaliation is to remove the problem of human error and to make the response automatic.

Dr. Strangelove

In the War Room, President Muffley learns from the Soviet Ambassador about the doomsday device, which the Soviet Premier was planning to announce on the following Monday. The doomsday device was designed to respond automatically to any U.S. nuclear attack by releasing the entire Soviet arsenal and bringing about a nuclear winter. If activated, the doomsday device would ensnare the earth in a cloud of radioactive fallout and endanger all life on the surface of earth. This device turns out to be the main obstacle in resolving the crisis because once triggered, it cannot be stopped.

President Muffley: “But, how is it possible for this thing to be triggered automatically, and at the same time impossible to untrigger?” (54:42)

Dr. Strangelove: Mr. President, it is not only possible, it is essential. That is the whole idea of this machine, you know. Deterrence is the art of producing in the mind of the enemy...the fear to attack. And so, because of the automated and irrevocable decision making process which rules out human meddling, the doomsday machine is terrifying. It’s simple to understand. And completely credible, and convincing.

Interestingly, a decade after the release of movie, the Soviet Union began developing the Perimeter system, which consisted of a network of sensors and computers. The system, was completed in 1985 and known as the Dead Hand, would allow junior military officials to launch missiles without oversight from the Soviet leadership.

Once trigger, Perimeter would automatically order the launch of long-range missiles at the United States if it detected nuclear detonations on Soviet soil and Soviet leaders couldn’t be reached. In case of reality mimicking fiction, Perimeter was kept secret from the United States; its existence was not revealed until years after the Cold War ended.

Perception and Communication

Deterrence is an inherently psychological concept and depends both on accurate perception and communication by decision-makers on both sides of the deterrence equation. The nature of the deterrent must be properly communicated by the deterer and accurately perceived by the deteree. To achieve a credible deterrent, your opponent must believe that you have the will and capability to follow through with your threat. It is thus critical to communicate threats clearly and accurately.

Even so, this does not guarantee accurate perception by your opponents. In conflict situations, both sides have a tendency to perceive the actions of each side through a negative lens, thinking the enemy is more evil than it really is, not realizing one’s own faults, and not understanding how one is perceived by the other side.

However, a deterrent that is kept a secret will certainly fail.

Dr. Strangelove: “Yes, but the... whole point of the doomsday machine... is lost...if you keep it a secret! Why didn’t you tell the world, eh?” (56:29)

Dr. Strangelove

President Muffley rejects General Turgidson’s recommendation for
an all-out nuclear attack against the Soviet Union and decides to try to negotiate a better resolution. Unable to communicate with U.S. bombers heading to destroy designated targets within the Soviet Union, President Muffley invites the Russian Ambassador into the war room to convince Soviets that the U.S. has not launched a surprise attack and needs their help to resolve the situation.

General Turgidson exclaims his shock at the President’s decision: "He’ll see everything. He’ll see the big board!"

President Muffley: "That is precisely the idea, General. That is precisely the idea."

Without full transparency, it would have been impossible to convince the Soviets that the U.S. had not launched a sneak attack. President Muffley discloses the locations of all of the U.S. bombers and asks for Soviet assistance to shoot the bombers out of the sky. Sadly, the Soviets were unable to bring down one bomber...

**Technology and Geography**

**Technology** and **geography** shape the context for deterrence and can lead to deterrence failure if misunderstood. The nature of technology and geography, whether it favors the offense or the defense, determines how both threats and deterrence requirements are perceived by decision-makers. Throughout history, the interaction of technology and geography has often been a deciding factor in determining whether there are military strategies that are more effective for achieving offensive victories or for defending against military attacks.

Within specific geographical contexts, the nature of technology has a direct impact not only on the costs and benefits of any course of action, but also on the perceived chance of success or failure of deterrence. If countries can adequately defend against any attack, then they can deter their opponents using a strategy of deterrence by denial. If defense is not possible, countries will depend primarily on deterrence by retaliation.

During the Cold War, certain technologies were considered destabilizing (such as multiple independent reentry vehicles or anti-ballistic missile defense) because they enhanced the value of a surprise first strike and impaired the successful operation of deterrence. In contrast, technologies that enhanced reliable retaliatory strikes (sea-launched ballistic missiles from submarines) were viewed to be stabilizing and as enhancing the credibility of deterrence.

**Dr. Strangelove**

The context in which Dr. Strangelove takes place, the risk of surprise attack to bombers located on the ground, served as the early backdrop for nuclear deterrence. During the early Cold War period, there was a legitimate fear about a surprise nuclear attack from the Soviet Union. But this time was rather short-lived.

Until the 1960s, the U.S. held the advantage in numbers of nuclear warheads and delivery systems. During this period, offensive strategies were considered more advantageous than defense due to the nature of existing technology. Bombers were vulnerable to attack as long as they were sitting on the ground. If the Soviets could defeat U.S. nuclear forces in a single blow and take out all of our bombers, a preemptive attack was a viable and attractive strategy for them. The risk, of course, was that not all U.S. nuclear forces would be wiped out and the U.S. would retaliate with its remaining arsenal.

At the time of the film’s release in 1964, the Soviet Union and U.S. were already competing over a new game-changing technology that would enable "push-button" warfare with intercontinental ballistic missile (ICBMs). Since an ICBM could deliver a nuclear warhead in approximately 30 minutes, it would not allow sufficient time for the movie plot to unfold. In contrast, the Soviet delivery of a nuclear bomb on U.S. territory would require 8-9 hours of flight time, allowing for the movie plot to unfold as planned. Kubrick and Schelling decided to restrict the setting of the film to the time of bombers. Consequently, there is no discussion of ICBMs.

In the film, the Soviets felt compelled to build the doomsday device for a couple reasons related to the technology. Internally, the doomsday device could exert stabilizing effects. It would reassure commanders that the Soviet Union would retaliate and keep them from becoming trigger happy or hastily responding to a false alarm. But the doomsday device also helped to ensure effective retaliation and enhance credibility. With a doomsday device, the Soviets removed the problem of “human meddling” from their deterrence equation.
However, the Soviets also feared a doomsday gap. During much of the Cold War, the Soviets and the Americans perceived themselves to be in a zero-sum situation. Any gain by one side was perceived as a loss by the other side. Whatever United States did to improve its security diminished the security of the Soviet Union. And so, both sides build up arms responding to or fearing the adversary’s buildup.

The Ambassador explains that they had to build it when they learned of a similar program in the United States. Though a defensive measure to protect against human error, a doomsday device could offer a first strike advantage if the Soviets were successful in taking out U.S. command and control. As such, the device could be viewed as destabilizing for deterrence. Though destroying the world once with a doomsday device would suffice, the United States would need a device too, to avoid a doomsday gap.

Ambassador De Sadeski: "There are those of us who fought against it, but in the end we could not keep up with the expense involved in the arms race, the space race, and the peace race. And at the same time our people grumbled for more nylon and washing machines. Our doomsday scheme cost us just a small fraction of what we’d been spending on defense in a single year. But the deciding factor was when we learned that your country was working along similar lines, and we were afraid of a doomsday gap." (53:14).

General Turgidson: "Gee, I wish we had one of them doomsday machines." (55:25)

Discussion Questions for Teachers
- Why was there a fear of a surprise attack during the Cold War?
- What major assumption does the strategy of deterrence rest upon? How does this assumption fail to hold up early on in the film?
- President Muffley calls General Ripper psychotic, but General Turgidson says that we should refrain judgment until all the facts are in. Why?
- What does Wing Attack Plan R entail? Why is this plan critical for achieving effective deterrence?
- How does Wing Attack Plan R potentially jeopardize deterrence?
- Why does General Turgidson consider preemption to be the only rational response at this point? Is his proposal rational?
- What is the doomsday machine and what is its primary objective?
- How does Dr. Strangelove define deterrence in the movie? Do you agree with his definition?
- Why does President Muffley allow the Russian Ambassador into the War Room?
- Why did the Soviets fear a doomsday gap?
- Would a doomsday device be perceived as stabilizing or destabilizing?
- In what ways did deterrence fail in the film?
- As depicted in the film, is nuclear war winnable?

Additional Resources
- Dan Lindley, University of Notre Dame has produced an excellent teaching guide on Dr. Strangelove covering many additional topics introduced by the film and providing a wealth of fun facts about the movie. When I first started using the film to teach about deterrence, I often referred to his guide as a critical resource. I am indebted to him for his comprehensive overview.

- National Security Archive, George Washington University provides a comprehensive summary of films produced by the Air Force to counter what was portrayed by films coming out of Hollywood including the SAC Command Post video mentioned in this issue. It also provides footage accessible online.

- The Supercritical Podcast has produced podcasts on a growing collection of movies including Fail Safe and War Games.

Related Films
When I teach about deterrence, I compare and contrast Dr. Strangelove with Thirteen Days. I also show clips from Fail Safe and the CNN documentary series on the Cold War. If you are using film to teach about nuclear weapons and deterrence, you may want to use clips from several films. I use many of these films and documentaries in my class:
- Fail Safe (1964) - American planes are sent to deliver a nuclear attack on Moscow, but it's a mistake due to an
electrical malfunction. Can all-out war be averted?

- **Thirteen Days (2000)** - A dramatization of the Kennedy administration's struggle to contain the Cuban Missile Crisis in October 1962.

- **Cold War (1998)** - A 24-part series which deals with the relations between the United States, the Soviet Union and their respective allies between the end of World War II to the collapse of the Soviet Union in 1991.


- **War Games (1983)** - A young man finds a back door into a military central computer in which reality is confused with game-playing, possibly starting World War III.

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2. Ibid.