WHY WARGAMING WORKS

Peter P. Perla and ED McGrady

Wargaming has a long history as an important tool for military training, education, and research.[1] In its broader application to nonmilitary conflict situations (see, for example, the recent books *Wargaming for Leaders* and *Business War Games*), the technique is increasing in popularity, particularly among businesses seeking strategic advantages.[2] (As a result, we will sometimes use the terms "wargaming" and "gaming" interchangeably; in the latter case, however, we mean what is called "serious gaming," not the more general sense, like gambling.)[3] Despite that history and popularity, however, wargaming's record of success is uneven. Some games seem to succeed very well in preparing important decision makers for real-world environments in which they later find themselves. A prime example is the U.S. Navy's series of games during the 1920s and 1930s, which helped train the commanders who won the Second World War in the Pacific. Other games do not do so well; for example, the game played by the Federal Emergency Management Agency in July 2004 did not seem to help that agency respond effectively to Hurricane Katrina's landfall only two years later.

The reasons for the successes and failures of wargames of all types are as varied as the games themselves. Sometimes success stems from particular circumstances of subject matter and participants; sometimes failure flows from poor design or faulty facts. When it works, wargaming can appear almost magical in its power to inform and instruct; when it

Dr. Perla earned a PhD in statistics from Carnegie-Mellon University. He has more than thirty years' experience as an analyst, project director, and research manager at the Center for Naval Analyses (CNA), in Alexandria, Virginia. He has directed more than thirty research projects and has led, supported, or consulted on many gaming efforts for the military and other agencies. He is the author of The Art of Wargaming *and of numerous articles and is the designer of three commercially published simulation games.*

Dr. McGrady, also of CNA, holds a PhD in chemical engineering from the University of Michigan. He develops games and conducts studies on a wide range of topics from force structure and planning to operational deployment of medical forces and the analytic reconstruction of real-world operations. He has deployed as an analyst with U.S. forces in combat and counternarcotics operations.

Naval War College Review, Summer 2011, Vol. 64, No. 3

doesn't work, it can appear almost childish in its oversimplifications and abstractions.

We believe that wargaming's power and success (as well as its danger) derive from its ability to enable individual participants to transform themselves by making them more open to internalizing their experiences in a game—for good or ill. The particulars of individual wargames are important to their relative success, yet there is an undercurrent of something less tangible than facts or models that affects fundamentally the ability of a wargame to transform its participants.

This article explores that undercurrent. We characterize it in terms of the relationships among wargaming (in its broadest sense), narrative storytelling, and the inner workings of the human brain. We propose the idea that gaming's transformative power grows out of its particular connections to storytelling; we find in a combination of elements from traditional narrative theory and contemporary neuroscience the germ of our thesis—that gaming, as a story-*living* experience, engages the human brain, and hence the human being participating in a game, in ways more akin to real-life experience than to reading a novel or watching a video. By creating for its participants a synthetic experience, gaming gives them palpable and powerful insights that help them prepare better for dealing with complex and uncertain situations in the future. We contend that the use of gaming to transform individual participants—in particular, key decision makers—is an important, indeed essential, source of successful organizational and societal adaptation to that uncertain future.

We find inspiration and support for this position in an intriguing book by the German psychologist Dietrich Dörner, *The Logic of Failure*.[4] In this work, Dörner argues that "geniuses are geniuses by birth, whereas the wise gain their wisdom through experience. And it seems to me that the ability to deal with problems *in the most appropriate way* is the hallmark of wisdom rather than genius."[5] In simplest terms, Dörner believes that we need to "learn to deal with different situations that place different demands on us. And we can teach this skill, too—by putting people into one situation, then into another, and discussing with them their behavior and, most important, their mistakes. The real world gives us no chance to do this." But games do. The need to explore, repeat, and reflect on decisions made in the context of games is critical to what we must do to learn better how to cope with a world rapidly moving beyond our range of real experiences. Improving the ability of our games to help us do this, in turn, demands that we improve our understanding of why wargaming works.

NARRATIVE AND GAMING

We begin our exploration by considering the relationships between narrative and gaming. Throughout human history, narrative—storytelling—has been a

fundamental way to understand events we did not or cannot experience. Narratives take many forms, but the best ones succeed in placing those who experience them into the flow of events and activities they describe. A suspension of disbelief occurs as readers, watchers, or listeners experience the vicarious emotions and actions brought out by the narrative. Exploring this idea further, we will discuss research—literary, psychological, and neurological—that has illuminated the processes by which this suspension of disbelief occurs.

Games are participatory narrative experiences. There are many different types of games, from the board games of our childhood to modern computer and online games, and to that mainstay of military games, the tabletop or seminar game (or even the derisively named BOGSAT—Bunch of Guys Sitting around the Table).[6] Although this article applies to games in general, much of our default perspective derives from this latter class of games, so familiar to the denizens of McCarty Little Hall, in Newport. At their most intense level, which we call "high-engagement games," games draw players into both participating in and constructing their narratives; they literally place the players inside the narratives. In fact, gaming is an even more powerful way to experience narrative than reading a book or watching a film. Like literature and film, high-engagement games give players a taste of the emotional and empathetic challenges they may face during situations like those presented in the game. Unlike literature and film, games give players active responsibility for their decisions, similar to what they would experience in the real world, and force them to bear many of the same consequences of those decisions, both positive and negative.

Those consequences include not only the physical changes to the decision-making environment (such as the loss in battle of an important warship) but also the psychological effects of both making those decisions and dealing with their effects. For example, during a large-scale real-world disaster, decision makers will face emotional and psychological stresses as well as operational challenges. Strictly intellectual exercises, including simple, scenario-based planning, seldom create emotional or psychological stress. Indeed, no planning system or training tool can cover every possible contingency or produce the same stresses experienced in reality. Real people do not die in wargames. Nevertheless, effective high-engagement games can equip leaders better to confront whatever contingency they must actually face, regardless of its similarity in detail to the game actually played. Leaders responsible for making crisis decisions and living with their consequences will benefit from the synthetic experience derived from playing high-engagement games—as well as from the additional mental tools they can develop through that experience—to help ready themselves for confronting those challenges. At the very least, these synthetic experiences will help prepare

them to ask the critical questions during planning and preparation for the unpredictable range of possible futures.[7]

Synthetic Experience through Stories

Literature and cinema are ways in which nearly everyone has experienced real situations and events synthetically. An example of literature affecting policy is the story of how Richard Preston's novel *The Cobra Event* influenced then-president William Clinton.[8] As Tom Mangold and Jeff Goldberg report in their own book *Plague Wars,* "Ironically, everything that Clinton had previously learned about biological terrorism from official sources did not have as much effect on him as the Preston novel. The book found a curious resonance within Clinton, which led to a profound interest and concern about the threat. Indeed, Clinton was so alarmed by what he read that he asked U.S. intelligence experts to assess the book's credibility."[9]

At about the same time, in March 1998, the White House ran a wargame on biological terrorism. These events combined to cause the president to call a special cabinet meeting on bioterrorism on 10 April 1998. As a result of this meeting, Mangold and Goldberg report, President Clinton asked Congress to add $294 million to the counterterrorism budget.[10]

The dramatization of the narrative in *The Cobra Event* (and the reinforcement of that experience in the game) seemed to access parts of President Clinton's imagination and attention that other sources of information could not. By showing him the consequences, including the political and social dangers, of such an event, the narrative became a powerful warning of what he himself would face in the event of a biological incident.

But what does narrative do that is different from other forms of discourse? After all, plenty of words had been written in the open-source and intelligence literature about the threat of biological weapons before President Clinton read *The Cobra Event.* What makes telling a good story more powerful than other forms of communication?

The Power of Prose

To explore this question more fully, we turn now to literary theory. Let's begin by delving into the meaning of prose.

"Prose" is a generic term that can mean any writing that is designed to mimic everyday speech in its rhythms and word choice (i.e., prose is not verse). Prose can be divided further into whether it concerns facts (nonfiction) or is imaginative (fiction). Prose can also be divided according to the mode of writing: exposition, argumentation, description, or narrative. At its most basic level, prose is simply words with meaning that are written on a page or spoken. This literalist, or factual, aspect of prose would mean that the words "he picked up the gun and

shot" both are the actual words and letters (hepickedupthegunandshot) and convey the everyday meaning that we would ascribe to them (the act of obtaining possession of a particular weapon and firing it).

Prose that tells a story (the narrative form) creates meanings that go beyond the effect of simply presenting facts; the narrative forms an image in the reader's mind of the thing being described. Likewise, narrative can cause the reader to react emotionally to the information being presented—to laugh, cry, feel afraid. These emotions are not contained in the facts presented on the page or in the literal meaning of the words. Rather, they are created in the reader's mind by the interaction between the reader and the words on the page. Here the meaning of "he picked up the gun and shot" may invoke a range of emotions or empathetic feelings, depending on its context in the overall story line.

Between the literal presentation of words on the page and the reader's reaction to them, there is a place that does not exist in the real world but that has real effects on the reader's mind. In literary theory this is called the *l'entre deux,* the "between place." It is in this in-between world, where narrative is real and everyday reality has retreated into the deep background, that the reader engages in what we all learned about in high school, the suspension of disbelief. The *l'entre deux* is real for the reader, even if it is nowhere to be found on the page. It is neither on the page nor absent from the world. It is not in the world as constructed in the literal meaning of the words on the page. It is between the real and the unreal, between the reader and the page.

Samuel Taylor Coleridge first used the term "suspension of disbelief" to mean "transfer from our [the author's] inward nature [of] a human interest and a semblance of truth sufficient to procure for these shadows of imagination that willing suspension of disbelief for the moment, which constitutes poetic faith."[11] In other words, the author creates a fantasy or fictional narrative that is sufficiently engaging (the author's responsibility to the reader being itself a major theme of literary theory) to cause the reader to believe in what is not there—that is, to have "poetic faith."

If you parse Coleridge's statement carefully, you will see that the focus is on the author's ability to create the suspension of disbelief. It does not refer to the reader's giving the author the benefit of the doubt, as is sometimes meant when the term is applied to games. Here we use Coleridge's sense, one that places the requirement squarely on the author (or game designer) to affect the reader (or player). All the reader has to do is enter honestly into the narrative; suspension of disbelief will happen if the author has constructed a believable story world populated by believable characters.

There are, in fact, several different ways of looking at suspension of disbelief: from the literary perspective, as a phenomenon created by the author and

entered into by the reader; from the philosophical perspective, understanding what is real and what claim imaginary realities have on being real; from the psychological and cognitive-science perspective, which views thought and belief as interrelated processes of perception and understanding; and, finally, from the neuroscience perspective, where imagination becomes a sequence of neural and perceptive processes that occur, starting with raw perception and leading to belief about the nature of the world. This intersection of literature, philosophy, cognitive science, and neurology gives us a number of independent perspectives on how this phenomenon works and how we should consider it.

A View from Neuroscience

Now let's take a step beyond literary theory into the realms of the biological and psychological study of the human brain. Neuroscientists and psychologists studying belief and perception model the suspension of disbelief as a multistep process. When suspension of disbelief occurs, the reader enters into a half-real state where all of the information provided at the time of reading is believed, but upon almost immediate reflection some of it is discounted as fiction.[12] That is, before any higher thought processes are engaged, at the initial moment of perceiving the words on the page readers will believe all of what they read, but upon further consideration they dismiss some of its elements as "fiction" and accept other elements as "real." The process used to determine whether or not we believe what we read is known as the "systematic" system; it is slower to react than the "automatic" system that first processes the work of fiction. What determines the extent to which a narrative or other piece of prose invokes the systematic system and at what intensity is the extent to which we can take real action on the basis of that information.[13] Without the need to take real action, the systematic system may be invoked at a lesser intensity or not invoked at all.

Neurological experiments suggest that this dual process of understanding is at work when we consume any sort of fiction or art. For example, scientists conducted a test with students by giving them two text passages to read. One factually described the process by which George Washington became the first president; the other used dramaturgical techniques to create some uncertainty as to whether he would be elected. Depending on which passage they had read, students had different reaction times to the subsequent question, "Was George Washington the first president?" The students reading the less cut-and-dried passage took longer to answer, even though they "knew perfectly well that in fact George Washington was elected the first president."[14] This suggested to the experimenters that the answer came more slowly due to the lack of clarity in the narrative, which made students believe, even if temporarily or fleetingly, that Washington may not have become president.[15] This effect is called "anomalous

suspense."[16] As we read a narrative we briefly believe both the truth of the world as we know or believe it to be and the untruth that is presented by the narrative. It is only afterward that the slower process of sorting out fact from fiction occurs. That sorting process is driven by our analysis of whether we can or must act on the information presented.

This experiment and its conclusions seem a bit odd, even to us, and it doesn't prove much. It is, however, suggestive and agrees with our own sense of that brief resetting of reality that sometimes occurs after reading a good novel, seeing a great film, or playing a powerful game.

This dependence on the possibility of action is an important component of a neurological understanding of the human mind. Perception and understanding are both tangled up with the problem of acting in the world, because the brain is designed not only to work within itself in some abstract intellectual environment but also to move our whole organism physically through the real world.[17] "Reality checking involves a continual assessment of the relation between behavior and the environment."[18] Thus, while we are suspending our disbelief in a narrative, we are also not yet engaged in the practical process of deciding whether we can use the information we perceive from that narrative to act in the real world. Ultimately we get around to making this decision, even if some of the blurriness of the difference stays with us.

Cognitive-theoretical attempts to distinguish between imagination and belief have constructed a concept similar to the *l'entre deux.* Scientists define a "pretense box," where pretenses (or imaginative flights) are distinguished from beliefs or desires by the function they perform. Pretenses, beliefs, and desires are functionally different, but one hypothesis holds that all three are processed by the same code within the mind, resulting in effects for a pretense similar to those for a belief. The pretense for belief activates our response to a situation, but it is tempered by the separate and contrary pretense that the situation is fictional.[19]

Games as Constructed Narrative

So what does all of the preceding discussion of narrative and cognition have to do with wargaming? Wargames, particularly what we call high-engagement games, extend the imaginative work of art or literature into the physical world and place the participants in control of some portion of the narratives. Players are participants, not merely spectators. As a result, high-engagement games embody two types of narrative: the "presented narrative," which is what we call the written or given narrative, created by the game's designers; and the "constructed narrative," which is developed through the actions, statements, and decisions of the game's participants. The overall game narrative comprises both the presented narrative and the constructed narrative.

The concept of constructed narrative implies that the players are confronted by active choices and that in response to those choices—and consequent to their physical presence in the narrative—they must construct responses to the game's presented narrative. This response is a separate discourse of the players, which merges with the presented narrative of the game to create a synthetic product that is not exclusively that of the players or of the game designers. Players in a high-engagement game not only make choices but also speak and act to explain to other participants their choices—as well as their reactions to the choices of the game designer and the other players. This creates a conversation among everyone involved in the game, one that creates a unique narrative.

In the same way that traditional narratives can invoke emotional or suspenseful responses in their viewers, the narrative arc of a game can invoke a range of emotions in its participants. Players can become excited at the expectation of a significant victory or apprehensive at the possibility that an opponent will exploit a weakness. Likewise, games can present unpleasant information or place players in upsetting situations, resulting in arguments or heated exchanges. These emotions are equivalent to the normal sense of suspension of disbelief, whereby an inanimate and abstract narrative brings about a real-world reaction in the viewers.

As narratives, then, games can create the same reaction as any story. But high-engagement games are more than simple narratives; they employ ranges of physical cues, as do movies or stage plays. The latter rely on visual, auditory, and symbolic cues (cues with social meaning beyond their meanings as everyday objects); a game extends the range of cues to include the physical venue where the game takes place, the control of game play, the physical actions of the players (kinesthetic cues), the social interactions among the players, and dramaturgical effects revolving around those social interactions. These elements are unique to games, and in particular they are most powerfully present in live-action role playing—the quintessential high-engagement games.[20]

The Venue. Although visual and auditory cues from the game designers make up the basis for the game—they are the way the overall scenario and narrative are presented to the players—they in no way make up all of the game. The most basic element of the game experience is the venue, the physical space in which the players act during the game. The venue could be as simple as a tabletop with a map on it or as elaborate as a multimedia, multiroom environment where players interact with each other, with technology, and with a wide range of services during the course of the game. The venue creates among the players and the game controllers spatial and temporal relationships in a way most similar to the role that the physical stage and set play in live theater. These physical

relationships can reflect and help organize hierarchical or communications relationships. The venue also organizes players and their interactions into groupings that depend on the size and layout of the physical area (or perhaps even the computer network) used. One often-overlooked aspect of game design is, in fact, adapting the game concept and design to the physical plant that is available.

Game Control. The aspect of a wargame that is most noticeably different from other narrative forms, including a stage play, is the concept of "control." There are two broad classes of control, which are found in different measure according to the game's design. "Active control" relies on human game controllers, who closely follow player actions and respond to those actions in real time to drive the game forward. "Passive control" relies on a predefined rules set that the players interact with instead of human controllers. In this latter case, computer consoles, game map, or other displays and player aids help the players visualize the game's universe, encode the rules, and spatially organize player actions and options.

Kinesthetic Cues. What is not controlled by the game designers is how the players participate in the world the designers have created and how they interact with each other. Kinesthetic cues occur as players take action and move through space during the game. Cues could be as simple as players walking over to someone to talk, or they could involve actual manipulation of objects, such as miniature representations of the world—for example, maps, telephones, briefing slides, or even physical or conceptual and mathematical models. Unlike the other ways in which the game designer's narrative influences the player's experience, the movement of the players within the game space is (usually) entirely up to the players. The venue and game structure (rules and scenario, for example) can influence how a player acts in a game, but players' actions are ultimately separate, uncontrolled elements of the game, distinct from the presented game narrative.

Social Interactions. The social and cultural interactions that occur in the game create new ways of presenting and changing the narrative experience of the players. The social element of the game affects the way in which players present themselves to the game world and the other players. Because human social perceptions are attuned to understanding the intentions and behavior of people and groups, this self-presentation adds a significant amount of information to the experience.

In a high-engagement game two sets of social relationships are present, those of the real world and those of the game world. These relationships play off one another; often the people experiencing the game have social or organizational

relationships in the real world. These relationships affect the type and nature of acceptable behavior in the game. On the other hand, the game also enables behaviors that might not occur in the real world—because, after all, "it's only a game." This interplay between real-world and game-world relationships can be exploited by the game designer to create a dynamic tension that can allow players to identify and work through real-world organizational conflicts using the mechanism of role playing in the game.

Dramaturgical Effects. Dramaturgical effects are signals that people send in social situations to establish both their identities and the overall social relationship.[21] Business scholarship, in attempting to understand all of the elements that go into organizational relationships and decision making, hypothesizes that within the context of a social situation people do things to present themselves to others in a way that resembles theater more than it does rational organizational processes. An example is the way charismatic leaders treat their subordinates (think of General George S. Patton's famous statement that his staff didn't need to know when he was acting, as long as he did himself) or how they frame themselves as respected in their fields, as intelligent or powerful (think of theme music, such as "Hail to the Chief"). All of the various elements of self-presentation —what you say (scripting), where you say it (staging), how you act (performing), and how you "spin" it (framing)—go into creating the "dramaturgical presence."[22] People's identities, both their views of themselves and how others view them, come from the social interactions they experience. They are not fixed, through some internal function.

In a game, as in real life, players must present themselves to others in such a way as to reinforce the social identities they have constructed. By extension, players also represent or present their parent organizations' identities to others in the context of the game. When required to represent functions different from their normal personae or to embody types of persons different from their normal selves, players face an unusual social situation. Because they know their roles in games are constructed ones, they can enter into them in ways that differ from how they might normally present themselves in real social situations. Likewise, their play in a game is different from performing in a stage play, because on stage the actor is interpreting the script and director's instructions, not (usually) making it all up on the spot.

The l'Entre Deux *of Games*

As a result of those considerations discussed above, the players enter into a game's *l'entre deux* in a way entirely different from the reader's process of suspending disbelief in a traditional narrative. The combination of venue, kinesthetic actions, social interactions, and dramaturgical effects—all moderated and

responded to via active or passive control—allows the players to come closer to entering literally into the world of the game than they ever could in a watched or read narrative. For the game, the *l'entre deux* does, in some ways, actually exist outside of the players' minds—in their actions and their interactions with other players. Because they are dramaturgical actors in the game, the players occupy a "between place" far closer to reality for them than do passive spectators or readers of other narrative forms.

If we consider the cognitive-neuroscience model we discussed previously, the normal narrative disbelief that arises from a reader's inability to act on the information presented in a text narrative is foiled in a game, because the player actually can (and must) act on the narrative information the game presents. Likewise, because they occupy a constructed narrative (the game) as well as constructed dramaturgical identities (their roles in the game), the players need to think as if they are in a real world in order to maintain their game identities —further working against disbelief. In games, then, disbelief is suspended twice, once when the players enter into their roles and again when they use their new (game) identities to construct the game's narrative.

Thus, games can be divided into narrative elements (those things that the designers present to advance the story) and dramaturgical elements (those that require the players to take some action in the real world). Visual, auditory, symbolic, and venue cues form the backbone of the narrative elements in a game; the players construct the rest of the narrative through their kinesthetic actions, their social interactions, and dramaturgical effects. All of this means that players invest in the game more of their own identities—as well as their conceptions of what is real and fictional—than they do in a prosaic narrative. Because of the stronger *l'entre deux* that the players enter during the game, that investment can have a more substantial effect on the participants than would a traditional narrative. The players own the between world, and for them it becomes less fictional and more real.

GAMING AND REALITY

Games have their rhetorical modes, and, just as other narratives do, games can have effects in the real world. However, a game is also a trick, a sleight of hand that makes the players believe, if only temporarily, that they are someone else doing something else. As with any fictitious narrative, at the end of the game the players will recognize that the events they experienced in it were not real experiences; that the roles they occupied were not their real jobs and lives; and that the narrative they helped create did not happen in the real world. However, any compelling narrative that has affected its readers or viewers emotionally leaves an effect even after the suspended disbelief in the narrative's reality has worn off.

After games, because of their stronger *l'entre deux,* players carry with them even more of the conflict between reality and fiction that the games created. The game's narrative is the player's narrative as much as it is the designer's or the controller's (or the sponsor's). It is created by the players and owned by them, in a joint effort with the designers and controllers.

The *l'entre deux* the players enter through a game's narrative forces them to assume responsibility for the actions and events that occur as a result. It places the consequences of their decisions and actions before the players, and in fact it places those consequences directly on the players. Having to assume responsibility for the consequences of their own actions (as well as of those events beyond their control) gives the players insight about the emotional, psychological, and personal consequences that a real event would have for the actual decision makers whose roles they assumed during the game. The game creates empathy in the players for the roles they are playing, through the suspension of disbelief. Further, because the players are more inclined to see a role-playing game acted in the real world as part of both the *l'entre deux* and the real world, they bring these emotional and psychological states with them back into the real world after the game ends.

Prosaic writing limits itself to accepted signs and meanings in order to convey its facts. Great prose and great games capture meanings that have never been said—meanings that have not yet been recorded as narratives—and make them accessible to readers or players.[23] High-engagement games dealing with speculative or future events capture those new meanings and make them accessible. Those new meanings created within the players and brought with them out of the game—out of the *l'entre deux* and into the real world—affect how the players will act not only during events of the kinds considered in the game but also during any future events they may encounter.

What does this mean? It means that in high-engagement role-playing games we have a powerful tool that can be used to help players learn how better to balance the equation between the cost of preparing for the uncertain future and the risk of not doing so; can help enlighten players about the fact that unexpected and unpredictable events, including embarrassing ones, do happen and that there are real consequences when they do. Without that synthetic experience, it's all too easy to dismiss the most challenging of possible events, particularly when the conventional wisdom presumes that it is simply not worth the cost of preparing for the emotional, psychological, and cultural consequences of contingencies so unlikely. When players have experienced both the personal and organizational costs of such Black Swan events—if only during a game—they develop new perspectives on them.[24] Probabilities affect budgets and lines of authority; consequences affect emotions, relationships, and values.

High-engagement games mask the pressures of the former and so give the players unique opportunities to experience the challenges of the latter.

CAUTIONS

Of course, wise practitioners must be as cautious when using high-engagement games as must be any wise user of power tools. Games can use the power of narrative persuasion to manipulate players into false beliefs and assumptions in any number of ways. For that reason, game designers have a responsibility to avoid many of the common mistakes that organizations make when they consider future challenges. These errors include both presenting mistaken information or under- or overstating the dangers involved in these events (i.e., just getting it wrong) and also what we call "the sanitary fantasy"—assuming that nothing can ever possibly go wrong and no one will ever misbehave.

Just Getting It Wrong

Games that make this error embed the players in a narrative that creates a false impression about the danger and consequences of a future event or situation. This can cut either way—minimizing the consequences or exaggerating them beyond what is reasonable. In both cases the game has lied to the players, which will result either in their learning incorrect lessons or in their disbelieving the outcomes and recommendations that flow from the game—even the most reasonable and applicable ones, least affected by the lies.

A good example of just getting it wrong is the *Dark Winter* game. *Dark Winter* was a high-level decision-making game about smallpox response held from 22 to 23 June 2001 by the Johns Hopkins Center for Civilian Biodefense Strategies and the Center for Strategic and International Studies. The game involved many people who at one time or another in their careers actually would have been involved in a response to smallpox. They included former governors, senior leaders of the public health and homeland security communities, and a former senator, Sam Nunn, playing the role of president of the United States. The game got it wrong in positing a 1:10 transmission rate for smallpox, a very large incidence that would result in a widespread and virtually unstoppable catastrophe.[25] Of course, using too low a rate might have produced an equally exaggerated result in the other direction.

Given that games such as these affect the emotional and psychological relationship of the players with the subject matter, it could be argued that a more emotionally compelling but less physically severe outbreak could have created similar stresses on the players without overestimating the physical threat of the disease. For example, the victim population could have been smaller but more emotionally affecting, such as immuno-compromised individuals or pregnant women. Or the threat of the unknown, represented by only one or two cases,

could have been played against the players' imaginations, letting them feel the impending doom of a worst-case scenario but without predicting large numbers of downstream casualties.

The exercise received considerable official and media attention at the time, reflecting the emotional reactions that many of the senior-level participants had to confronting a serious disease outbreak that they had little or no capability to stop. Senator Nunn's testimony is interesting in his use of emotional language; for example, referring to the two days of play by the team representing the National Security Council, he stated, "I will skip the agonizing details. . . . [O]ur NSC 'war gamers' dealt with three weeks of simulated shock, stress, and horror."[26] However, the exercise also received considerable criticism for overstating the danger and for presenting a biological attack as an apocalyptic threat that could be overcome only by herculean effort.[27] Even more disturbing, some of the assumptions made in *Dark Winter* have been applied to other biological agents in other exercises.[28] In his testimony before Congress after the game, Senator Nunn stated, "I determined from our wargame that public health has become a national security issue, but that we are unprepared. . . . The members of our simulated NSC, as well as state and local officials, were desperate." Creating such desperation testified to the power of the gaming narrative; in this case, however, doing so by overstating the physical transmissibility of the disease illustrated how easily wrong (or at least questionable) facts can skew the experience in ways that can distort the insights the game creates.

The Sanitary Fantasy

The sanitary fantasy is much more difficult to detect (and so to correct) than simply getting it wrong. It is not about what is included in the game but rather what is left out. The effect can be illustrated by a quick example: design a game to capture the strategic decisions faced by the United States over the course of the war in Iraq. Elements such as the challenges of building an alliance, the ability to engage and destroy insurgents, and the restoration of services to the population all would be obvious pieces to include in the design.

But there is a Black Swan, one that circles above the design of any game of modern irregular conflict. How do you deal with those things you cannot expect or anticipate, because they are so at odds with how you see the world that you cannot possibly, either emotionally or politically, imagine their happening? Things that violate your fundamental worldview, like Abu Ghraib?[29] If it does not include factors like Abu Ghraib, and its subsequent effect on how the United States was viewed in the Arab world, it is unlikely that any game architecture could present an effective, realistic scenario, particularly on the emotional and political levels. Military wargames can sometimes reduce the likelihood of such

failures by incorporating freely acting adversaries (Red teams). But even expert military Red teams are slaves to their own worldviews—and all players are subject to the sometimes insidious preconceptions of the controllers and assessors. If Black Swans are truly unpredictable, much of that unpredictability literally is due to the inability of people to imagine what is to them the unimaginable.

Contingencies like the abhorrent behavior at Abu Ghraib or the confusion of the federal response to Hurricane Katrina, and the resulting, respective media firestorms, are Black Swans—unpredictable because they exist in a realm of possibilities where we do not want to go or where our cultures, life experiences, imaginations, and worldviews block us from going.[30] They are examples of the unsanitary and unsavory set of problems that reflect badly on us, on those who are designing and playing the games. Whether it's our weapons systems not working as promised, our contractors going over budget or time limits, or our colleagues advancing their individual agendas at the expense of the overall organization, we too often don't want to admit that such things happen. But they do. And they often become the very things that decision makers have the hardest time grappling with.

SO WHERE DID WE END UP?

Wargames are synthetic experiences; to make the most of them, we need to integrate them with all the other tools (analysis, exercises, history, real-world experience) that we have available to help us make sense of what we can and should do in the present and the future.[31] Wargames derive their power (for good or ill) from their nature as constructed narrative; they have a more powerful effect on participants than do other narrative forms, because their participants not only are spectators but must act, engaging parts of their intellect and emotions not accessed during simple storytelling. Games are story-living experiences. By engaging their players in ways more similar to acting in the real world than reading a novel or watching a film can be, games affect their players in ways more deeply remembered and more transformative of their personae than other techniques for entertainment and learning. As a result, wargaming, gaming, serious gaming —whatever we call it—is a powerful tool for affecting how people think, feel, and behave.

In military environments, wargames have been important for at least two centuries. In nonmilitary environments they have become more important and more widely applied over the past fifty years. They offer us a promising means to prepare decision makers for the complex and uncertain environments that the pace and depth of change in global dynamics are driving, at ever more breathtaking speeds and in ever more surprising directions.

To deal effectively with the Black Swans lurking in our future—including those unsanitary ones that too often drive the most serious effects of events but that we prefer not to think about—our leaders need to develop synthetic experience, best available to them through such games. Those games need to move away from our traditional approach to dealing with the uncertainties of the future by trying to predict events based on assessment of relative probabilities. Instead, we need to focus on exploring events on the basis of their relative consequences, less to prepare for specific consequences than to prepare our human decision-making apparatus for the physical, intellectual, and emotional environments—full of complexity and uncertainty as they will be—in which our leaders will have to decide, whatever specific events they confront.[32]

Games can do that, but only if their designers and those who sponsor and fund them reverse their own internal priorities about what is important (stressing tangible consequences rather than abstract probabilities) and what is true (human reality rather than bureaucratic convenience). Games are powerful tools that can create synthetic experiences even more powerful than some real ones. Game designers, in turn, have a responsibility to ensure that their games reflect the truth. We can help our players learn and internalize that truth only by incorporating in our games not just our best understanding of the facts, as does the best physical science, but also a fundamentally honest assessment of human nature, like that found in the best literature.

In particular, high-engagement, role-playing games allow participants to interact with other human beings in situations involving competition, conflict, and cooperation—a great and necessary opportunity. But they are not without their limitations:

- It is difficult to play such games in other than real time. Although accelerated clock speeds and time jumps are possible, actual decision making cannot take place in anything other than real time, no matter how we try to convince ourselves otherwise, for the simple reason that humans can live and act only in real time.
- It is difficult to record what happens and why with enough fidelity and completeness to make it profitable and instructive to review and reflect upon events and decisions.
- It is difficult to explore variations in the decisions made and what the outcomes of those decisions might have been, especially to explore all the mistakes that we make.
- It is difficult to repeat an in-person, multiplayer game like a high-engagement game and impossible to "replicate" it in the sense of a Monte Carlo simulation experiment.

As a result, high-engagement role-playing games can represent one crucial element of the learning process, but they cannot be the only element. No one form of wargame can meet all our needs.

- We need high-engagement role-playing games to help decision makers experience interactions with other humans and also the emotional and psychological effects of those interactions.
- We need board-game-like tools (that is, manually managed open systems) to allow players to see (and even change) how elements of the game's models work to translate decisions into effects and events, so as to calibrate both those models and the insights the players derive from them and the play of the game.
- We need computer-embodied games to allow for ease of recording, ease of repeating, and ease of reflecting on experiences to assist in developing our "commonsense" approaches to dealing with uncertain and complex situations, as Dietrich Dörner argues so effectively in *The Logic of Failure.*

Ultimately, to make better games we need to tell better stories. We need to help our audiences learn better how to learn from those stories. Just as games, analysis, exercises, and real-world experience are all important tools that we need to integrate in a synergistic process, different types and modes of games play their own distinct roles (pun fully intended). Yet all games derive their power from the same source—their ability to open up their participants to self-transformation through the power of shared and constructed narrative.

But while recognizing the power and utility of games, we must simultaneously remain aware of their potential for mischief, a potential they share with all narrative forms. As our colleague and Naval War College professor Stephen Downes-Martin pointed out in his comments on an early draft of this article, it's hard to beat Hitler's *Mein Kampf* as an example of a narrative that exerted powerful influence on its audience. Its narrative played on the reader's emotions directly even while at times appearing to engage their intellects. Stephen has argued repeatedly—and, with us, directly—about the need for wargaming to be more than just an art form, to move into the realm of science. Artistic, narrative truth is one thing; scientific truth (true facts?) another. How do we best combine and balance them in our games?

This issue is one we hope to think about and explore farther in the future. For now, however, we propose the following concluding thoughts, optimistic and even triumphalist as they are.

THE BOTTOM LINE

Wargames cannot escape their narrative nature, nor should we want them to. But the *use* of wargames, the discipline we call "wargaming," must adapt the tool to the purpose. Like a film or a book, no game is purely entertainment; by creating an experience, albeit a synthetic one, all these narrative forms inform and educate us to one extent or another. If we wargamers—we who create and employ these tools—are to fulfill our responsibility to our agencies, our companies, our nation, and yes, our species, we must first recognize why wargaming works and then apply its power in constructive and helpful ways to address the complex and uncertain issues that we face now and will face in the future.

As a final postscript, we offer an even more expansive view of how gaming can affect the real world and real people for the better—a prophetic vision from Jane McGonigal, the director of game research and development at the Institute for the Future:[33]

> Reality doesn't motivate us as effectively [as games do]. Reality isn't engineered to maximize our potential or to make us happy. . . .
>
> When we play, we also have a sense of urgent optimism. We believe wholeheartedly that we are up to any challenge, and we become remarkably resilient in the face of failure. Research shows that gamers spend on average 80% of their time failing in game worlds, but instead of giving up, they stick with the difficult challenge and use the feedback of the game to get better. With some effort, we can learn to apply this resilience to the real-world challenges we face. . . .
>
> We can harness the power of game design to tackle real-world problems. We can empower gamers to use their virtual-world strengths to accomplish real feats. Indeed, when game communities have been matched with challenging real-world problems, they have already proven themselves capable of producing tangible, potentially world-changing results. . . .
>
> Those who understand this power will be the people who invent our future. We can create rewarding, transformative games for ourselves and our families; for our schools, businesses and neighborhoods; for an entire industry or an entirely new movement.
>
> We can play any games we want. We can create any future we can imagine. Let the games begin.

NOTES

1. See, for example, Peter P. Perla, *The Art of Wargaming: A Guide for Professionals and Hobbyists* (Annapolis, Md.: Naval Institute Press, 1990).

2. Mark Herman, Mark Frost, and Robert Kurz, *Wargaming for Leaders: Strategic Decision Making from the Battlefield to the Boardroom* (New York: McGraw-Hill, 2009); Benjamin Gilad, *Business War Games: How Large, Small, and New Companies Can Vastly Improve Their Strategies and Outmaneuver the Competition* (Franklin Lakes, N.J.: Career, 2009).
3. For a discussion of the serious game movement see, for example, "Serious Games Summit," *GDC: Game Developers Conference 2011,* www.gdconf.com/.
4. Dietrich Dörner, *The Logic of Failure: Recognizing and Avoiding Error in Complex Situations* (Cambridge, Mass.: Perseus Books, 1997).
5. Ibid., p. 193 [emphasis original].
6. For BOGSATs and other pitfalls of gaming, see Robert C. Rubel, "The Epistemology of War Gaming," *Naval War College Review* 59, no. 2 (Spring 2006), esp. p. 116.
7. For a discussion of gaming as a source of synthetic experience, see Perla, *Art of Wargaming,* p. 199. For the use of gaming to help prepare decision makers by developing decision strategies, see Dörner, *Logic of Failure.*
8. Richard Preston, *The Cobra Event* (New York: Ballantine Books, August 1998).
9. Tom Mangold and Jeff Goldberg, *Plague Wars: The Terrifying Reality of Biological Warfare* (New York: Macmillan, 2000).
10. Ibid.
11. Samuel Taylor Coleridge, *Biographia Literaria: or Biographical Sketches of My Literary Life* ([1817]; Project Gutenberg, July 2004), www.gutenberg.org/etext/6081.
12. Norman N. Holland, "Spider-Man? Sure! The Neuroscience of Suspending Disbelief," *Interdisciplinary Science Reviews* 33, no. 4 (2008), pp. 312–20.
13. Ibid.
14. Ibid.
15. Ibid.; Richard J. Gerrig, *Experiencing Narrative Worlds: On the Psychological Activities of Reading* (New Haven, Conn.: Yale Univ. Press, 1998).
16. Richard J. Gerrig, "Reexperiencing Fiction and Non-fiction," *Journal of Aesthetics and Art Criticism* 47, no. 3 (Summer 1989), pp. 277–80.
17. Holland, "Spider-Man? Sure!"
18. Robert T. Knight and Marcia Grabowecky, "Escape from Linear Time: Prefrontal Cortex and Conscious Experience," in *Cognitive Neurosciences,* ed. Michael S. Gazzangia, 4th ed. (Cambridge, Mass.: MIT Press, 2009), pp. 1357–71.
19. Shaun Nichols, "Imagining and Believing: The Promise of a Single Code," *Journal of Aesthetics and Art Criticism* 62, no. 2 (Spring 2004), pp. 129–39.
20. Hobby or commercial "live-action role-playing games" (LARPs) take these venue, kinesthetic, and social aspects of a game to an extreme—players physically act out and "live" their roles, often over multiple days in a real-world venue. LARPs are different from the professional, organizational games we are discussing here in that LARP players are far more immersed in the game world.
21. R. S. Perinbanayagam, "The Definition of the Situation: An Analysis of the Ethnomethodological and Dramaturgical View," *Sociological Quarterly* 15, no. 4 (Autumn 1974), pp. 521–41.
22. William L. Gardner and Bruce J. Avolio, "The Charismatic Relationship: A Dramaturgical Perspective," *Academy of Management Review* 23, no. 1 (1998), pp. 32–58.
23. Maurice Merleau-Ponty, *The Primacy of Perception* (Evanston, Ill.: Northwestern Univ. Press, 1964).
24. The idea of the Black Swan (capitalized), an unpredictable event with massive consequences, was popularized in Nassim Nicholas Taleb, *The Black Swan: The Impact of the Highly Improbable* (New York: Random House, 2007).
25. For a detailed discussion of what variables were used in *Dark Winter* see Tara O'Toole et al., "Confronting Biological Weapons: Shining Light on 'Dark Winter,'" *Clinical Infectious Diseases* 34 (2002), pp. 972–83. In that article the designers of the exercise admit they were faced with a serious choice: picking a too-low transmission rate might lead to false assumptions, but a too-high rate would cause excessive concern.

26. Milton Leitenbert, *Assessing the Biological Weapons and Bioterrorism Threat,* Strategic Studies Institute Monograph 639 (Carlisle Barracks, Pa.: U.S. Army War College, December 2005).

27. Noah Shactman, "DHS's New Chief Geek Is a Bioterror 'Disaster,' Critics Charge," *Wired,* 6 May 2009, www.wired.com/.

28. Leitenbert, *Assessing the Biological Weapons and Bioterrorism Threat.*

29. Abu Ghraib is the site of the worst of the abuses of Iraqi prisoners inflicted by U.S. service members in the first years following the fall of Saddam Hussein.

30. On media firestorms, see, for example, Brad Tiffee and Sean R. Fontenot, "Louisiana Catastrophic Hurricane Planning Workshop," *Louisiana Emergency Preparedness Association* 27, no. 2 (Spring 2005); and U.S. Government Accountability Office, *Hurricane Katrina: Better Plans and Exercises Needed to Guide the Military's Response to Catastrophic Natural Disasters,* GAO-06-643 (Washington, D.C.: May 2006), available at www.gao.gov/.

31. For a detailed discussion of this idea, see Perla, *Art of Wargaming,* pp. 285–90.

32. Dörner, *Logic of Failure.*

33. The extract is from Jane McGonigal, "Be a Gamer, Save the World," *Wall Street Journal Wireless Edition,* 22 January 2011, www.wirelessweek.com/.