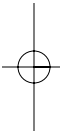
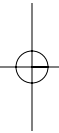


## Part III

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# Producing Pedagogical War

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## Chapter 7

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# Mobilizing Affect

## The Politics of Performative Realism in Military New Media

*Dan Leopard*

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Any serious student of the media, their future impact and development needs . . . to take seriously the cost-benefit, means-ends thinking of engineers. Indeed the specific visions of technological use and development that such engineering thinking may at any time favor and propagate can only be critiqued if it is first understood.

(Garnham, 2000, p. 70)

In Orson Scott Card's science fiction novel *Ender's game* (1985), Earth's military command selects 10-year-old Ender Wiggin to attend Battle School and, upon promotion, Command School. At these institutions of military training, students learn to engage combat by playing an immersive—"serious"—game that simulates intergalactic warfare. Over the several years that follow, Ender masters gameplay and excels at leading spaceships full of children-warrior-players in tactical maneuvers against the "buggers," an insect-like alien species at war with Earth.

At the novel's conclusion, following a series of exhausting battles in which he sacrifices the lives of many of his fellow players, Ender finally engages in an all-out assault on the bugged home world. In the final attack, having learned to play like no other before him, he displays a reckless, tenacious brutality verging on barbarity. He readily deploys the weapon known as the "little doctor," a device that destroys the bugged queen and, through her, the entire bugged civilization.

As the bugged home world explodes, Mazer, a legendary commander from the first bugged war, steps forward from the bloc of military brass that has been observing Ender's play. He explains that the simulation on which Ender trained for years had, in fact, been seamlessly replaced with a media-interactive command structure that allowed for actual battle to take place based on Ender's gameplay. Earth's commanders needed Ender to believe that his moves were merely actions in a game so that he would exploit his knowledge of bugged psychology fully while taking necessarily extreme actions to overcome his foe.

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Card's novel pivots on the morality involved in supplanting virtual with actual combat. By using a game simulation, Earth's military sought to dampen Ender's emotional affect—the compassion that serves as a brake on operational forms of violence and savagery—while masking the destructive actuality of effective warfare. This opening scene isolates what Card's narrative suggests drives military simulation and military-based interactive games—an ethos of *performative realism*. An attempt to create interactive transparency (an illusion that stands in for what we perceive to be the casual verisimilitude of everyday life) is what organizes the production agenda of the entertainment industry, the military, and the computer research centers that design and implement the code at the heart of the video games, special-effects blockbusters, and interactive simulations that these institutions produce and distribute.

### **Performative Realism: Saddam Hussein, Buggers, and Klingons**

According to Richard Lindheim, founding Executive Director of the Institute for Creative Technologies (ICT) at the University of Southern California in Los Angeles (and a one-time producer overseeing the *Star Trek* franchise for Paramount), the Pentagon originally approached him to create a military simulation system saying, "We've been thinking of what the ICT should do. Very simple, why don't you develop the holodeck from *Star Trek*."<sup>1</sup> As *Star Trek* fans know, the holodeck was a simulation room featured in the *Star Trek: The Next Generation* television series. While in the holodeck, crew members could touch objects generated by a holographic virtual reality system and even appear to travel back in time (a concept that was featured in several episodes of *The Next Generation* series). Through the evocation of a holodeck-style simulation system, the ICT's military sponsors were merely using an available entertainment form as a metaphor to guide their research agenda. That the ICT was founded as a confluence of entertainment media, military training, and computer science helps to explain how science fiction can become a model for research, especially since *Star Trek* centers on thrilling tales of a federation space ship exploring—at times policing—the boundaries of the universe. As the ICT is part of an initiative at the University of Southern California, known for its close ties to Hollywood, and funded by the US Army, it seems easy to extrapolate that the holodeck would suffice as a romanticized vision of what a collaboration between the military and the entertainment industry could pursue.

Seeking to explain the multiple applications that could result from research at the ICT, Lindheim remarked: "The same engine can be used for education or entertainment, or for a networked game. What's the difference between fighting Saddam Hussein and fighting Klingons? It's just different applications of the same technology."<sup>2</sup> Of course, Saddam Hussein, even after his execution by the recon-

stituted Iraqi state, existed as an actual person living in the world, while the Klingons are a fictional, and, given the status of the *Star Trek* series, one could say mythical, race of beings often at war with humans. Lindheim demonstrates a troubling ethical slippage between the ongoing, lived worlds of daily life, whether in a combat zone or in New York City, and the fictional worlds being developed by the ICT.

Lindheim's comments on the similarity between education and entertainment, Saddam Hussein and Klingons, suggest the assumed ease with which the military objectives of simulation training are predicated on a naïve form of realism, such that simulated battle and actual combat are interchangeable (in ways that also easily evoke Ender's game).<sup>3</sup> The premise of the ICT training simulations is to prepare officers for military command in hostile combat situations. As one army spokesperson explained during an interview with CBS News: "The most dangerous time for a soldier is the first two weeks of combat." This goal, to get past the early learning phase of combat (in which, if one fails, one may die), implies that the simulations are capable of miming reality and thus providing the experiential lessons necessary to save a soldier's life. Or, as a Brigadier General demonstrating the ICT virtual reality headgear for the same CBS *Sunday Morning* program observed: "It feels very real . . . This is the kind of simulation that makes you sweat." In other words, the acuity of the visual and aural interface generated physical responses in the General that allowed him to experience the simulation at the emotional and corporeal level.

Therefore, for the ICT researchers there needs to be more than simply a visual and auditory correspondence between the rendering of the virtual human scenario and the world of actual combat; there also needs to be a representational realism that affects the body directly. Users must perform as if the representations and narratives of the simulation had consequences for the body at the level of movement, emotion, and situational understanding. In this regard, the rendering of the virtual humans in a visual style drawn from, and consciously evoking, video games links the interaction and training of the military's new media with that of the performance of gameplay. The sweat of conflict and speed of action during a first-person shooter game are exactly what the ICT researchers hope to achieve in their training scenarios.

### **SASO-ST at ICT**

Stepping into the widescreen projection room at the ICT calls to mind the experience one has upon entering an IMAX movie theater at a local theme park. Although the scale of the experience is considerably reduced at the ICT, the immersive quality of the IMAX experience dominates. The audience at the ICT's Virtual Reality (VR) demonstration room is presented with a large wrap-around screen and the latest in audio and image projection technologies. While the ICT's screen might be dedicated to presenting cutting-edge research combining artificial

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intelligence (AI) and real-time animation technologies, nevertheless the whiff of IMAX's origins in a cinema of attractions from the silent movie era and the boardwalk rollercoaster lingers throughout each ICT demonstration (see Gunning, 2000, pp. 229–235). And perhaps this is as it should be since the ICT's goals are to use the best techniques for immersive reality drawn from the entertainment industry and apply these same techniques to the training needs of the military, making it a cinema of attractions geared to combat during wartime.

Splayed across the screen is a series of overlapping operating system windows. Lines of computer code rain down across the main system window. In another window appears a list of file folders containing key elements of the US Army training scenario SASO-ST (short for “Stability and Support Operations Simulation and Training”).

The three rows of seats are filled mostly with personnel from the ICT gathered together for a troubleshooting session. A technician sits at a workstation with a stack of computers and other digital gear at the back of the room. The room overflows with people. There are not enough chairs for everyone.

The scene on the screen is a dimly lit triage room. The patients who inhabit the triage area are visually coded as foreign (dark skin, black hair, Arabic dress), while the female doctor, who is attempting to calm a woman clad from head to toe in black, has blond hair and wears a starched, white hospital smock. A fly buzzes about the room, appearing at times to be extremely large as it closes in on the viewer's perspective. In the background there is a whiteboard covered with marks scribbled in red and black marker. Blood has splattered across the wall and there are pools of blood on the cracked and worn wooden floor. The wallpaper is torn and degraded.

Hospital cots fill the room. Several of the cots are dressed with sheets soaked red with blood. On one cot lies a man with a severed arm and leg. He waves his stumps in the air. Coagulated blood smears the white gauze that covers each of his severed limbs.



Figure 7.1 The Triage Room in SASO-ST. Image used with permission from USC Institute for Creative Technologies

On the couch in the right-hand corner of the room, a small girl weeps while rocking back and forth on her knees. As the scene progresses, it becomes apparent that each of these digital characters repeats their individual movements on what appears to be a loop. The man with severed limbs rotates his bloody stumps again and again, the nurse reassures the black-clad woman with the same gesture over and over, and the girl on the couch wails and rocks.

From within the darkened theater someone asks when the test is going to begin. Someone else answers, "We're waiting for the doctor." A man in the back of the room turns to the technician and says, "You can go ahead and run it." The angle on the room changes abruptly as the point of view of the camera (following closely the conventions of first-person shooter video games) appears to sweep across the scene and then move through a door. A male doctor with tanned skin and dark curly black hair beneath a surgeon's cap appears in frame. He leans against the edge of a wooden desk, holding a cup of coffee in his right hand, staring intently out at the audience.

Arabic writing can be seen on the tapestry that covers a side wall of his office. The back wall has a large observation window through which the patients on the cots in the triage room are seen. Along the bottom edge of the window frame are packing boxes and crates. Tacked to one wall are charts diagramming troop movements.

On the left-side screen there sit nested within a window folders that read "verbal communication," "Doctor's environs," and "emotions in the global context." At the top corner of this screen is another window filled with a series of sliders charting the status of the Doctor's emotions. These sliders read simply: "joy," "hope," "distrust," "fear," "anger," "guilt," and "anxiety."

"Hello," the Doctor loudly proclaims. He speaks with a strong accent as he firmly crosses his arms across his chest. From somewhere in the darkened VR theater an audience member comments, "Scary man." Someone else adds that the Doctor is taking his "Avoidance stance." Another asks, "How is his trust changing?" As the Doctor changes position, the sliders representing his level of emotional composure appear to fluctuate.

The Doctor addresses the man in the back of the room who initiated the simulation, "Sir, we're trying to help this patient." The Doctor's accent is difficult to place. Is it Arabic, Spanish, or the result of audio distortion? There is an echo or reverberation each time the Doctor speaks. The Doctor addresses the man in back—the "user"—as "Captain." In the SASO-ST scenario, the conflict arises when an Army Captain (the User) must convince the Doctor to move his make-shift hospital to a safer location. What the Doctor does not know, but intuits from the remarks of the User, is that the site upon which the hospital is located is scheduled to be shelled by artillery in the next few days. The Doctor plans to bargain with the User to try to acquire transportation vehicles and medical supplies for his hospital in exchange



Figure 7.2 Doctor Perez in SASO-ST. Image used with permission from USC Institute for Creative Technologies

for agreeing to move his facility. The officer-training component arises from the User's need to negotiate the best deal for the US Army while convincing the Doctor to agree to move his hospital.

The Doctor speaks again, "We can reach an agreement." This time what he says is distorted, but the words are recognizable. Then he spurts out a series of repeated words that are distorted and garbled beyond recognition.

Compared to earlier simulations developed at the ICT, SASO-ST has a very detailed look to it. The walls, furniture, and clothing are deeply textured and cast shadows that give a sense of naturalism to the location and its characters. On the audio track, bomb and fan sounds shake the floor of the VR theater (the audience has been told that special subwoofer speakers have been installed so that they can feel the bombs as they explode).

The onscreen Doctor smiles and says: "Very nice to meet you." Looking at the emotion sliders on the left-hand screen, it is obvious that someone has increased the agent's familiarity quotient. The Doctor continues: "What do you want?"

Larry Rasmussen, the man at the back of the room playing the part of the User (and a key cognitive science researcher at the ICT), says to the Doctor, "It's not safe here." Doctor: "Say again." Without prompting on the part of Rasmussen, the

Doctor continues, "Look at these people. Do you see that girl? She lost her mother today." A technician increases the Doctor's interdependence.

The Doctor adjusts his stance and then states emphatically, "You Americans with your guns and hamburgers." The speech erupts from the Doctor's mouth overlaid with distortion and reverberation. Someone comments, "He always talked fast."

The Doctor says, "Hello." Then follows up with, "Si." Then, "Say again." Rasmussen addresses the agent, "Dr. Perez." Dr. Perez responds with, "We need to help them. TOO-DAY." The last word is distorted and elongated as he speaks.

The camera sweeps past white hospital curtains lined up against the back wall of the triage room. The edges of the curtains are shredded and splattered with blood. Rasmussen says to the project manager: "Excuse everyone. We need to spend time debugging." Rasmussen continues: "There are two big demos next week. General Willis is coming through. He should be treated with deference. He has more influence than anybody." Most of the audience leaves, while a few remain for the debugging session.

## Face as Representation

The rhetoric of ICT research depends on conventional notions of verisimilitude and transparency. Verisimilitude is a goal for each of the ICT simulations in that a concept of realism—a mapping of the way in which the world works—is designed and rendered into each scenario. The movement and responses of each virtual human and their supporting cast of characters (who populate the scenes and operate on a loop) are developed so as to replicate photographic motion picture visuality (which is, of course, distinct from notions one may have regarding the "reality" of daily life).

Transparency serves as a complementary goal to verisimilitude in that the user should not have to learn to play the simulation, but should be able to readily understand the way the interface works and simply perceive it as a window onto a world. This world must respond in both its physics and social psychology as if it were grounded in everyday experience. However, the technical glitches and current limits on computer processing power serve to disrupt the transparency of the user's interactions with the virtual humans (a great deal of processing power is dedicated to the voice recognition portion of SASO-ST, while rendering the world and animating the characters also demand considerable computer resources). Under these technological constraints, the idea of seamless transparency remains a distant promise. As such SASO-ST necessarily represents to the user a garbled set of communication transparencies and a distorted form of verisimilitude.

But it is not simply the flak generated by the deficiencies of technology that undermine the intentions of the ICT designers and their Army backers; rather, it is

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the continuity of unexamined assumptions through which the ICT virtual humans develop over a series of simulations that causes concern. As social theorist Donna Haraway suggests, “Technologies and scientific discourses can be partially understood as formalizations, i.e., as frozen moments, of the fluid social interactions constituting them, but they should also be viewed as instruments for enforcing meanings” (2003, p. 23). In other words, the virtual human agent system is a record of the “fluid social interactions” that arise between the ICT designers and military cultures, and is an “instrument for enforcing meanings” upon the user of the training system.

New media theorist Lev Manovich emphasizes that there are forms of interactivity beyond what he calls “operational interactivity.” Although specifically addressing the formal and narrative aspects of new media (defined broadly, but concentrating mostly on interactive art and digital cinema), Manovich’s nuanced view of interaction is pertinent to understanding the interactivity built into the virtual agent systems at the ICT. Manovich (2001) states:

When we use the concept of “interactive media” exclusively in relation to computer-based media, there is the danger that we will interpret “interaction” literally, equating it with physical interaction between a user and a media object (pressing a button, choosing a link, moving the body), at the expense of psychological interaction. The psychological processes of filling-in, hypothesis formation, recall, and identification, which are required for us to comprehend any text or image at all, are mistakenly identified with an objectively existing structure of interactive links.

(p. 57)

While ICT simulations are troubled by their lack of functionality—at the level of button-pushing, link-choosing, body-moving as Manovich would have it—the psychological interactivity that Manovich describes is also hindered by the discrepancies in modeling the behaviors and emotions of their virtual agents. For users to believe in narratives about the world—in the psychologically complex ways that are commonly brought to novels and cinema—then the social and cultural cues that shape most interpersonal communication must be fluid and transparent. Through the branching structures of the SASO-ST narrative, while relying on Hollywood notions of storytelling for dramatic conflict, each of the characters, intelligent agent or otherwise, functions as a proposition about the nature of human interaction. Game studies scholar Phoebe Sengers suggests: “If humans understand intentional behavior by organizing it into narrative, then our agents will be more ‘intentionally comprehensible’ if they provide narrative cues” (2006, p. 102). Unfortunately, these interactions for the ICT are heavily coded through the typical telegraphic characterizations embedded in most Hollywood films and broadcast media.<sup>4</sup>

Dr. Perez represents a Spanish doctor working in Iraq. His accent is thick, although this is difficult to say for certain owing to the audio distortion that masked his voice during the test. This attempt at giving the agent an ethnic identity derives from the narrative scenario and alters the presence that the agent brings to the screen. While in the earlier versions of the ICT simulations which were built around STEVE (“Soar Training Expert for Virtual Environments”), an agent system that relied on politeness and coaching as a model for human interaction, the Dr. Perez computer architecture has been reworked from scratch and intends to present the user with an agent possessed of a more confrontational demeanor. As such, Dr. Perez exhibits a more complicated relationship with the user, embodied within the SASO-ST scenario as the Captain. There is a differential in power between the Captain and Dr. Perez and the intentions of each are at odds with the other. In the test described above, Dr. Perez begins the interaction with a telling bodily act of defiance by folding his arms across his chest. While Dr. Perez can barter and negotiate with the Captain, power ultimately resides with the user. If Dr. Perez fails to comply and move his hospital, with or without the help of the US Army, his location will be bombed in the days to come. The implied narrative is that many casualties will result and Dr. Perez will be at fault (although, surely the blame would fall on the Army if it were to happen). Obviously, the training goal here is for the Captain (i.e., the user) to make sure that this tragedy does not occur, but the implication is that Dr. Perez is idealistic and manipulative, wanting to leverage the situation to maximize the benefit to his hospital, and is therefore reluctant to simply comply with the Captain’s entreaties to move.

In addition, the overall visual realization of the SASO-ST scenario provides the user with a grim reminder of war while displacing the consequences. Those people who caused the man to lose his limbs or the girl to lose her parents are never named. Within the logic of the SASO-ST scenario, the US Army could have as easily been at fault, as could have Iraqi insurgents (though we must presume, based on following the money back to its funding source, that this is not so). What remains, though, is a dynamic of facial representation that codes the world of each simulation as a binary, in effect compressing the possibilities inherent in most real-world experiences, between a polite and helpful military and an obstinate and, at times, aggressive antagonist. It is no small matter that the conflict in the SASO-ST scenario is coded around ethnic “Otherness” to boot.

### **Emotional Content and the Quantification of the Self**

In the ICT promotional video and the tests that I observed, ICT researchers emphasized the range of emotional content that has been programmed into their virtual humans. Every user interaction with an intelligent agent generates a response

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on the part of the agent that is colored, or inflected, with differing degrees of emotional intensity on a numerical scale. As demonstrated in the SASO-ST test, the programmer overseeing a simulation can alter a simple slider on each scale for a set of emotional characteristics—joy, anger, shame, and such—giving the agent an interactive agenda that develops from the total emotional setting selected at a given moment. Each adjustment of a slider results in a change in the demeanor of the agent. Whereas the agent may have been reacting passively to the user, after a change in emotional content the agent begins to disagree and to suggest more aggressively alternative paths to his or her goal as defined by the simulation's training requirements. However, while the promotional materials boast an infinite range and variety of emotional responses on the part of an agent, in practice the agent's emotional possibilities at this stage of technological realization remain limited.

Regardless of the actual functionality of the agents and their emotional states in the current technological configuration at the ICT, the idea that one can quantify human emotions through adjustments in numerical sliders may seem resonant with the many dystopian futures depicted in science fiction literature and cinema. People for the most part hold firm to the idea that emotion, as much as cognition, separates humans from animals and robots (Damasio, 1994). Of course, this may stem as much from residual aspects of a lingering romanticism as it does from reliable fears of industrial production and consumption. But this resistance to quantification—at least at this juncture—does have an empirical basis. As cognitive scientist Richard Lazarus (2006) notes:

An emotional encounter is not a single action or reaction, as in a still photo or a static stimulus-response unit, but a continuous flow of actions and reactions among the persons who participate in it. This flow can generate new emotions or lead to changes in earlier ones. It is usually an action of some sort that precipitates an emotion sequence. We might call the action the provocation of the emotion.

(p. 14)

What Lazarus is claiming here is that human emotion works on a biological and conceptual level in ways that are more akin by way of analogy to an analogue system than to a digital system. And, of course, what the sliders represent in SASO-ST is a digital system that samples the range of possible emotions available to the agent as its interaction with the human user progresses. As in digital music where the appearance, a digital sampling, of the available frequency range stands in for the actual dynamic range of original source sound, the ICT researchers suggest that, contrary to Lazarus's conception of emotion as flow, what appear to us as nuances of emotion can be transcribed to a numerical scale composed of discrete units of intensity.

Trained musicians claim that digital sound, composed of a quantified approximation of the sound waves that exist in the pre-recorded world of performance, lacks the richness of both the original sound delivered by the orchestral instruments and the analog sound of tape or vinyl recordings. Now, the privileging or preferencing of one type of sound over another may be a result of a nostalgic longing for the recorded sound with which one is familiar, but nevertheless the sound on a digital recording is qualitatively distinct from that recorded on analog equipment. Moreover, most untrained ears can hear this difference if digital and analog recordings are played one after another.<sup>5</sup>

On the other hand, Rasmussen and the ICT researchers argue that, as the technology improves, the emotional representation through quantification will better reflect the finite, yet finely nuanced, range of human affective responses to situations. They claim, and rightly so, that their work is moving towards a greater verisimilitude as the technology and science improve. And while the stutters in voice recognition, pauses in movement, and strangely vacant expressions of the current crop of virtual humans fail to capture the distinct attributes of living human beings, in the near future, according to Rasmussen, these troublesome quirks will drop away in the wake of developmental breakthroughs.

Consequently, our predilection for reading all gestures and responses as emotionally resonant and representative of an agent's emotional state at a given moment will no longer be a problem as agent response time accelerates with increases in computer processing speed and algorithms of emotion that allow witty comments and facial expressions to match those of the human user. According to this line of thinking, the current dissonance between expected human response and simulated agent gesture will no longer exist. Lazarus (2006), whose work has been influential with Rasmussen in particular, argues this very point:

Even the absence of an action when it is expected or desired can be a provocation, as when we want another person to do something, such as give a gift or an opinion, express appreciation (gratitude) for a gift, or pay a compliment. However, in this case, the other person waits for the action in vain, which is what provokes an emotion, such as disappointment, anger, anxiety, or guilt.  
(p. 14)

Lazarus's comments highlight one of the key weaknesses of the SASO-ST test. But Rasmussen observes that an agent's emotional response need not correspond with the actual emotional interactions being comprehended by a human user. Instead, it matters only that the agent *appears* to speak and act using the appropriate emotional representation of what a human user believes is appropriate for a given situation.<sup>6</sup> This is a version, based on emotional attributes, of the famous Turing test for artificial intelligence in which a user interacts with another entity whose

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identity is unknown to the user. If the user is incapable of determining whether the entity is human or machine then for all intents and purposes the unseen entity is deemed intelligent by human standards (Turing, 2003, pp. 49–64).

Anthropologist Lucy Suchman describes one of the more famous versions of the Turing test employed in an early AI system called DOCTOR. DOCTOR relies on what she refers to, referencing sociologist Karl Mannheim, as the “documentary method of interpretation.” The DOCTOR program engages users by asking for generalized information regarding whatever psychological problems they are facing and then repeats back verbatim parts of their reply.<sup>7</sup> “Very simply the documentary method refers to the observation that people take appearances as evidence for, or document of, an ascribed underlying reality, while taking the reality so ascribed as a resource for the interpretation of the appearance” (Suchman, 1987, p. 23). Thus, the appearance of intelligence allows the user to believe that the more complicated processes that normally underlay intelligence are at work behind the formal attributes being displayed by an agent system. Emotion is likewise assumed by a user to have a depth of meaning generating the display that characterizes a given emotion, e.g., tears as a signifier for sadness and such (Reeves and Nass, 1996).

For the ICT virtual humans, this appearance of emotional content results from the quantification of affect as observed through human interaction. Each slider panel and numerical value serves to indicate intensities of emotion regardless of the causal incident or meaning from which an emotion event ensued. This particular approach to quantifying an area of human experience that previously relied on qualitative or intuitive explanations evokes the similar calculations during the nineteenth century that sought to create a science of vision. Art historian Jonathan Crary (1990) notes:

Vision, as well as the other senses, is now describable in terms of abstract and exchangeable magnitudes. If vision previously had been conceived as an experience of qualities (as in Goethe’s optics), it is now a question of differences in quantities, of sensory experience that is stronger or weaker. But this new valuation of perception, this obliteration of the qualitative in sensation through its arithmetical homogenization, is a crucial part of modernization.

(p. 147)

This method of thinking about vision disregarded the meaning that adheres to specific events and interactions, and replaced them with a focus on intensities and aggregates. This same reconceptualizing holds true for what the ICT researchers are trying to accomplish with emotion. The implications for this research agenda—the replacement of what we perceive as human emotional content with the appearance of this same content—returns us to the ethical dilemma posed by *Ender’s Game*.

While the intentions of the ICT researchers and designers are more benign than those that drove the military brass on Ender's Earth (attempting to provide military officers with the necessary interpersonal, cross-cultural training versus destroying an entire alien civilization), it remains that the simulation of emotion and cognition can have consequences in the actual world in which combat occurs. The ethics involved in developing simulations for combat training invoke other aspects of Card's science fiction parable as well. As one officer who attended the SASO-ST test suggested to me, he would like to run reconnaissance in the morning, design the simulation in the afternoon, and deploy his troops in the evening. While this goal is highly plausible, it ignores the larger cultural issues surrounding the ability of the designers to design for the actuality of combat as it may or may not "play" on the ground. And as this play is dependent on the multitude of variables available to simulation designers drawn from field reconnaissance—the validity of which is always in doubt—it suggests that a perfect correspondence between what is present in the field and what can be represented on the screen is a quixotic goal at best.

Furthermore, human communication in real time through corporeal bodily gesture, facial expression, odor, skin texture, clothing, and voice currently trumps all of the electronic and digital technologies available. Yet this does not mean that increased technological sophistication, call it greater "bandwidth," will not some day provide users with experiences comparable to today's face-to-face forms of human communication. By the standards of human communication and expressivity considered the benchmark by most people (communication taking place in the presence of others), all of the mediated forms of communication are lacking, but there is little consensus as to what exactly is lacking. Is it the warmth of touch, the physicality of another's body, or is it any of the myriad other communication channels available to those that are seated across from one another sipping a cappuccino? All of these "channels," value-added attributes of face-to-face interaction, signal a horizon that delimits the extent to which simulation can stand in for direct human communication. Gazing at that horizon, one sees the folly of romanticism in clinging to the "human" as the baseline for all interaction, but also the bracing chill of instrumental reason, the "cost-benefit, means-ends thinking of engineers" (and the military), as it plays out in *Ender's game*.

## Notes

1. From an interview with Richard Lindheim featured on the CBS *Sunday Morning* show, July 7, 2002.
2. This comes from a statement (circa 1999) quoted by Sharon Ghamari-Tabrizi (Ghamari-Tabrizi, 2004, p. 165).
3. Lindheim's pronouncement sounds a peculiarly postmodern note. For example, this equating of the fictional, read simulation, for the real (a privileged site of bodily sensory

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- coherence) strikes me as also evocative of the famous work of Jean Baudrillard (Baudrillard, 1994) and Fredric Jameson (Jameson, 1998), not to mention that of *The Matrix* (which acknowledges its debt to Baudrillard's work). Of course, much of postmodern high theory draws inspiration from science fiction discourse as well.
4. These rapid-fire characterizations—stereotypes in the broadest sense of the term—serve a useful purpose in many instances as they imply a recognizable biography for each character while foregoing the work, and screen time, necessary to provide a more fully realized back story for each actor that appears on screen. But as telegraphic characterization reduces a complex set of human interactions down to a routine set of expectations on the part of the viewer, narrative dilemmas occur—representational reductionism as such.
  5. While sampling technologies have improved greatly—and will continue to improve as research continues on digital audio—there is still a qualitative difference that is discernable between analog and digital recordings. Obviously, sound quality differs from technology to technology—with many claiming that mp4 audio such as that on Apple's iTunes is wretched—but it remains true that sampled audio loses much of the tonal warmth of the original. For a non-technical explanation related to the digital image, see Herb Zettl's widely used production manual, *Video Basics* (Zettl, 2007, pp. 42–46).
  6. For a lucid, perhaps even poetic, account of the cognitive science underlying Rasmussen's assertion, see the work of Antonio Damasio (Damasio, 1994, pp. 141–149).
  7. Obviously, laden with a large dose of irony, DOCTOR's approach to therapy mirrors that found in many reductive versions of the therapeutic method attributed to psychologist Carl Rogers.

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