THE SIMULATION OF CHAOS

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ABSTRACT

This paper expresses a concern that, in our efforts to use simulation as a technique to develop logical, objective and analytical decisionmakers, we may be disregarding a vital component of every significant decision--the human element. Important decisions are not made in an emotional vacuum; many simulation decisions are. This is unrealistic. The armed forces--past masters of the use of simulation during tines of peace--have been successful in integrating emotional considerations into the decisionmaking process particularly in the training and development of combat leaders. While business simulation does not ordinarily involve "life-and-death" decisions, some techniques used in military simulation may have universal utility. Some of these are described in this paper.

VOICES OF CONCERN

With increasing frequency, some authorities in this country are expressing genuine concern for an apparent decline in the perceived effectiveness of American managers. The editor of a British management magazine, after completing a series of interviews with managers in major cities in the United States recently, concluded that "U.S. managers are less confident than they were ten years ago, with many wondering whether the Japanese and West Germans are 'doing something we should be imitating.'' [4] A 1980 survey of Detroit engineers revealed that nearly half of them thought that the Japanese built better cars that Americans [5]. James L. Hayes, President of the American Management Associations, observed recently that the Japanese and the West Germans have responded far more vigorously than the Americans to the application of behavioral concepts involving participatory management techniques developed over the past 25 years [4]. There is some evidence that our country and, to a degree, our managers suffer from a lack of focus [7]. Perhaps. our problem is not a lack of focus but an overfocus on the "here and now" using the readily-available numerical data provided by our sophisticated information systems in ever-increasing quantities. Perhaps the increasing reliance on computer-based simulation techniques in the education of our managers is contributing to mind sets which are "antiseptically pure" regarding objective analysis in the decisionmaking process but limited regarding human values--and, therefore, potentially dangerous. Steven Muller, President of Johns Hopkins University, refers to such university products as "highly skilled barbarians" [10].

IN SEARCH OF A SOLUTION

If we have a problem in this area--and I suspect that we do--what can be done about it? Many organizations, large and small, are turning to management strategies such as Organizational Development to "open up the organizational innards," break down barriers to communication, confront rather than ignore human conflict and, most important, recognize in humans both their rational and emotional natures [2, pp. 403-4201. If this is. in fact, an emerging trend, are those involved in simulation and experiential learning developing their techniques to recognize the fact that decision and decisionmakers are influenced by human emotions? There is evidence that some are working on it. At the April, 1980 ABSEL meeting, Robert Pitts and Kenneth Thompson observed that "the direction [in simulation and experiential learning] has been centered too much around building mental skills and not enough emphasis placed on building diagnostic human skills ..." [6, p. 44]. At the same meeting, Louis White and Kevin Wooten reiterated the need to develop concurrently three basic skills--cognitive, behavioral and interpersonal--into management education programs [11, p. 93]. Richard Barton observed that "compared to the subtleties and nuances of human behavior, computer simulation models are extremely gross" [1, p. 14].

Decisions of any significance can have profound short- and long-term consequences. Recognizing this, decisionmakers often can and do become highly emotional regarding issues which may affect the rest of their lives and, in fact, the lives of many other people. Emotions such as these are difficult to generate in an academic environment where some degree of serenity and order are the desired norm. But, simulation is supposed to be a representation of reality; the reality is incomplete without the generation of some stress in the mind of the decisionmaker. In many cases, the need of the student for a satisfactory grade is enough to create the necessary Stress. This paper focuses on simulation techniques which stimulate emotions to a greater degree.

THE SIMULATION OF CHAOS
SOME MILITARY APPLICATIONS

Simulation, A Way of Life

Some people write about simulation. Others use simulation as a methodology to educate and train students. However, there is a profession where simulation is a way of life practiced virtually every day with considerable intensity. This is the lot of the military professional,

Combat-related planning, organizing, directing and controlling have been referred to as the "management of chaos." Military professionals must live lives of preparation for the worst of mankind's afflictions-- war--hoping it will never happen but ready to respond if and when It does. Human responses essential to victory in war often must take the form "unnatural acts--deliberate, purposeful, and aggressive activity under conditions where the probability of death or dismemberment is very high. Such behavior requires conditioning in peacetime--conditioning which simulates some, if not all, of the horrors and stresses of war without the finality of death or permanent harm. War is an emotional experience; simulation of war must stir the emotions or the representation of reality is lacking.

Simulation of some aspects of military operations is quite easy. Units which are designed to maintain equipment "practice their trade" in peacetime or war-- only the external environment changes. Simulation of combat conditions for high-technology activities is relatively simple. For example, a military aircraft

crew operates daily in its combat environment--the aircraft itself. Simulation of combat conditions can be developed external to the machine. However, the challenge of creating a realistic "fog of war" in the minds of those in labor-intensive combat organizations (for example, infantry units) can prove quite difficult, Innovative approaches are necessary in order to simulate the stress, discomfort, confusion and terror of life-and-death situations without encountering the high probability of unacceptable injury or loss of life. Since some of these approaches are rather unique and since I have personally experienced them, I will focus on simulation techniques used to train and develop ground combat units and, more particularly, leaders.

Airborne Training

No one is quite sure how he or she will react to the prospects of death until the threat is actually experienced. Yet, combat leaders must be expected to inspire subordinates to operate effectively and risk their lives under conditions of aggravate fear and psychological confusion. Airborne training, three intense weeks of activity for volunteers only, offers such an opportunity. Despite the fact that the need for parachute troops has declined since World War II, airborne training has been retained as a key training experience particularly for junior leaders of combat units. Leaping from an airplane in "fright" is, to most people, a classic case of an "unnatural act"--the parachute is actually a very antiquated form of transportation. During those agonizing moments of overcoming one's personal fear and making that "1.200-foot step," the junior leader learns a great deal about himself or herself rider profound stress. The "way nut" is always open; the student can quit at any time just as he could disappear in the confusion of combat. The critical importance of teamwork and precision is never more appreciated; the jumper's life is completely dependent upon the skills of the aircraft crew, the jump-master in the airplane and the person who packed the parachute. However, the rewards are almost instantaneous as the student glides to earth a partial master of. a powerful emotion--fear. The weeks of grueling preparation and exacting discipline associated with the training have paid off. A relatively safe experience (parachute jumping involves occasional injuries but very few fatalities) has contributed to confidence under stress which can be translated to other stressful situations. Simulation has contributed to the potential effectiveness of a combat decisionmaker by dealing with emotions in a direct and positive manner [8].

Leader Reaction Course

Based on the premise that, at least to a degree, leadership can be taught, the armed forces spend millions annually on a variety of leadership-related training activities. Simulation of situations requiring leadership skills is used extensively in a variety of forms. One such technique is found in the Army Leader Reaction Course. This course consists of a series of unique physical barriers constructed in a particular training area. Groups of students (usually five to ten in a group) negotiate and/or perform tasks at each of the barriers under the observation of graders. Each situation is different. Student groups are provided a variety of "tools" (rope, boards, 55- gallon drums, etc.)--some useful others extraneous-- and a specific task (for example, to evacuate a casualty over a barrier without coming in contact with a "contaminated" area). Student teams must analyze the task and the resources, consider a wide variety of alternatives, determine a course of action, organize their tools and human resources, and execute their plan--all while the clock ticks away. Usually, team leaders are not predesignated. "Natural"

leaders tend to emerge; "technical advisors" (those who can analyze the mechanics of the task) become identified; even the "non- leaders" become apparent. Such simulation hones the problem-solving and team-building abilities of junior leaders, applying moderate stress in the process. This type of simulation tends to be very popular with young people in that it combines challenge, unique situations requiring rapid analysis, competition and physical activity into one exercise. Such an approach might provide a welcome bit of variety to business simulation students who have been confined to their desks and calculators for prolonged periods.

Escape, Evasion and Code of Conduct Training

Concern over the disappointing vulnerability of some American servicemen to "brainwashing" techniques when taken prisoner during the Korean War led to interest im escape, evasion, and psychological preparation for possible capture by the enemy. All of the services organized training programs in this area with the Air Force leading the way because of its concern for pilots shot down over enemy territory. Simulation and experiential learning were applied extensively with the construction of elaborate stockades manned by "bestial guards" and "crafty interrogators." The Air Force received considerable adverse publicity from the press with revelations of "torture pits" and "excessive brutality"--cases of super-simulation. However, investigation revealed that, while discomfort and stress were intentionally included in the program, permanent physical harm was avoided, In fact, POWs of the Vietnam War commented very favorably regarding such training as psychological conditioning for the rigors of their prolonged captivity.¹ Once again, simulation involving controlled stress contributed materially to an important learning objective.

Combat Training

Training for ground combat conditions can take a variety of forms--most relying heavily on simulation and experiential learning. One approach is the command post exercise (CPX) where only commanders, staffs, headquarters personnel and necessary communication support actually participate. Subordinate units are simulated usually by controllers who report activities and respond to orders according to a pre-planned scenario. While relatively simple and inexpensive because "the troops" are not involved, the CPX is ideal for the development of command techniques and staff procedures. "Enemy" information--both accurate and inaccurate--is fed into the system. Friendly units are "deployed," "maneuvered," "resupplied" and occasionally "destroyed" referring to elaborate map boards while commanders and their staffs work around the clock learning in an environment of simulation. However, much of the realism associated with the *"fog* of war"-- the human reaction to chaos--is missing.

The introduction of "the troops" into the situation converts the simulation into a field training exercise (FTX) thus adding materially to the realism, complexity and cost. Realism is achieved through a variety of approaches.

The use of live munitions is often considered ideal. However, recognizing the hazards associated with modern weapons and their staggering costs, live fire exercises

¹ The author was engaged in research with a group of ten Vietnam War POWs after their release. It is interesting to note that, while the POWs were generally "prepared" for psychological torture, the training had not prepared them for torture involving intense physical pain.

are generally confined to small units under carefully controlled conditions. In the case of most costly weapons systems, much of the training is conducted using simulators or "sub-caliber" (smaller, less expensive) ammunition. With live fire exercises, it is obviously not possible to use a human enemy--inanimate, and therefore unrealistic, targets must be substituted.

Most field training exercises involve sub-lethal (usually blank) ordnance and both "friendly" and "enemy" forces. The representation of the "enemy" is

essential for combat training. The U.S. Army has gone to great lengths to develop an Aggressor organization complete with a fictional history, table of organization, symbols, uniforms, and insignia of rank. On Joint Exercise Desert Strike in 1962 some 20,000 U.S. Army troops (the combat units of two Army divisions) engaged in combat maneuvers as the Aggressor clad in dark green Aggressor uniforms (actually dyed salvage Army uniforms) their vehicles marked with the "circle- trigon" of the "Aggressor nation."

Psychological realism in field training exercises is influenced by a number of factors. First, the spirit of competition and unit pride is stimulated. Further, the 24-hour nature of tactical operations with extraordinary demands on minds and bodies takes it toll. Finally, almost invariably, the weather contributes to discomfort and discouragement among participants. Decisionmakers lose some of their "cool" after two days without sleep, soaked to the skin, and operating without lights at night in muddy, unfamiliar terrain. While the actual bullets are not whizzing by, the pressures associated with mission performance and concern for subordinates can be severe. The mistakes invariably associated with the "fog of war" occur with great frequency--the unit lost at night, the misunderstood order, the breakdown of a key vehicle, the malfunction of a critical radio set, the meal that never reached the troops. Except for some embarrassed people, these mistakes occur without significant harm--no one dies, no battles are actually lost. Ideally, they serve as learning experience-s which hone the skills of commanders. staffs and units and prepare for the day when the "game" might be "for real." Simulation is the essence of such training. The realism involved as perceived by the participants is largely a function of the imagination and skill of commanders. Results can vary from totally bored troops "going through the motions" to totally absorbed and involved troops sensing the urgency of the situation almost as if a real "enemy" were in the vicinity.

Ranger Training

U.S. Army Ranger units originated during World War II. While the number of Ranger units in the Army has declined to a few, the training--considered to be toughest in the Army--has been retained primarily for the purpose of developing junior combat leaders. For the eight weeks of the course, trainees are subjected to physical, mental, and emotional pressures designed to equal--at tines, exceed--those of actual combat. Ranger training involves simulation of a continuous combat environment. Trainees remove all insignia of rank; rank brings no favors; every man (no women have yet participated in the Ranger Course) has an equal opportunity for success or failure. The vehicle used for training is the infantry patrol. The terrain involved varies from sheer cliffs to waist-deep swamps. Throughout the process, the trainee is evaluated continuously and harshly; at every step the trainee has the opportunity to quit--literally, to give up. The trainee is intentionally demoralized, disorganized, disturbed and exhausted through a carefully articulated series of simulations--tests of physical and moral courage, strength, stamina, agility, judgment, problem-

solving ability and interpersonal skills. The "limits" of each person's human endurance are determined and then exceeded. These unknown "reservoirs of strength" which exist within some humans (hopefully, our leaders in times of crisis) can spell the difference between victory and defeat. Those who emerge from the experience with the cloth Ranger tab on their shoulders have experienced simulation in its most sophisticated and innovative form--simulation designed to test and develop the physical, mental and psychological capabilities of the student [3; 9].

CONSIDERATIONS FOR BUSINESS SIMULATION

My concern expressed at the beginning of this paper was that current trends in business simulation might be contributing to the development of mechanistic decisionmakers who ignore or subordinate human considerations because they cannot be readily quantified. I recognize that the problem, if it exists, involves two dimensions--the decision and the decisionmaker. My reference to military simulation techniques focuses specifically on human behavioral factors which influence the decisionmaker as he or she identifies the problem, makes assumptions, determines alternatives, gathers facts, classifies criteria for relevant comparative analysis, conducts the analysis and reaches a conclusion. Due to the fact that the military must prepare for chaos, it is logical that it has integrated some intentional chaos into its simulation techniques. I am not suggesting that business simulations be conducted in the mud or under simulated "life and death" conditions. I am, however, suggesting that emotion- free decisionmaking is unrealistic,

How can emotional considerations be integrated into the business simulation process without extraordinary costs, loss of control or complete distortion of educational objectives? Listed below are some basic ideas which might be considered totally or in part recognizing that many simulation techniques already incorporate such concepts *in* varying degrees.

- Introduce incomplete, irrelevant, suspicious or erroneous information into the simulation process requiring the players to make judgments concerning its Utility.

- Withhold or delay the delivery of vital information.

- Conduct the simulation in a non-ideal environment where human emotions are likely to surface (uncomfortable temperatures or humidity. poor lighting, excessive noise, distractions).

  Conduct the simulation at a tine when players are likely to be physically or mentally tired.

- Intentionally "betray" the players--introduce a new requirement just when players expect to relax--create situations where intra-group tensions are likely to surface.

- Declare the "natural leaders" of player teams "casualties" forcing less involved and less qualified players to assume primary responsibilities without advanced warning.

  Stimulate the emotional involvement of players by not only enhancing the rewards for success but also accentuating the penalties for failure.

  Attempt to quantify human behavioral factors in

order that human considerations have high priority among the decisionmaking criteria.

• Design, construct, and use a simulation technique similar to the Leader Reaction Course referred to earlier in the paper as a fun- oriented experience in practical decisionmaking.

I am sure that many will consider the suggestions. above, totally destructive regarding their objectives for the use of simulations as vehicles for learning. I recognize that we are attempting to reduce, not crease mental chaos by adding rigor and order to the potential manager's thinking process. This is fine so long as we do not lose sight of the fact that we are dealing with human beings with both rational and emotional dimensions in their personalities. If simulation is to be a representation of reality, let's be sure that we are realistic. Life can be chaotic--even for business decisionmakers.

REFERENCES

[1] Barton, Richard F.," Indexing Simulation Model Response for Gaming Flexibility," <u>ABSEL Proceed</u>-April, 1980. pp. 14-16.

[2] Beach. Dale S. <u>Personnel: The Management of People at Work</u>, 4th Ed. (New York: Macmillan Publishing Company. 1980).

[3] Cooler, Ernest E .."The Ranger Course," <u>Infantry</u>, September-October, 1980.

[4] Hayes, James L. "Memo for Management," AMA <u>Management Review</u>, November, 1980, p. 2.

[5] "An Industrial Nirvana." Time, September 8, 1980, p. 53.

[6] Pitts, Robert E. and Thompson, Kenneth R .,"Using Simulation and Experiential Learning in Industrial Settings," <u>ABSEL Proceedings</u>, April, 1980, pp. 44-49.

[7] "Remaking America Involves a Revival of Spirit," <u>U.S. News & World Report</u>, October 20, 1980, p. 65.

[8] Sult, Gale C., "Why Airborne?," informal talking paper, Fort Benning, Georgia, January 17, 1979.

[9] U.S. Department of the Army Field Manual 21-50. <u>Ranger Training and Ranger Operations</u> (Washington, D.C.: Government Printing Office. January 23. 1962).

[10] 'Universities Are Turning Out Highly Skilled Barbarians," <u>U.S. News & World Report</u>, November 10, 1980, pp. 57, 58.

[11] White, Louis P. and Wooten, Kevin C .,"CBID: Cognitive, Behavioral, and Interpersonal Development: A Skill Development/Social Learning Approach to Management Development," <u>ABSEL Proceedings</u>. April, 1980, pp. 93-97.