# SCENARIO PLANNING IN CRITICAL SCIENCE RESEARCH

by

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> "As long as a society's image is positive and flourishing, the flower of culture is in full bloom. Once the image begins to decay and lose its vitality, however, the culture does not long survive." (Polak, 1961)

The intent of this article is to describe the use of scenarios and scenario planning as emancipatory tools with a direct connection to critical science research. The use of scenarios in such a capacity requires the introduction of normative scenarios, or scenarios that are value-driven. Polak (1961) was an early advocate of the power of positive social images of the future. More recently, Ogilvy (1996, 2002) suggested that humans thinking about what the future *could* and *should* be also have a responsibility to think about what the future *ought* to be, promoting the use of value-driven scenarios. This article incorporates some of Ogilvy's (1996, 2002) and Polak's (1961) ideas, although the overall direction is not to provide the philosophical ground on which there is overlap between these two, rather, it is to show that scenarios have the capacity to help individuals and organizations transform their situations in practice. In taking this stance, the discussion of scenarios turns subjective and the ethical implications of decisions based on normative scenarios become clear.

Perhaps the most notable example of scenarios used in this way are those of a free, post-apartheid South Africa. That extraordinary example will be discussed in detail as well as the use of scenarios in community and nation building efforts. It will first be necessary to define what is meant by "critical," outline the critical science process, discuss its elements, and provide a rationale for using scenarios in a critical frame. The use of scenarios and scenario planning in this fashion allows considerations about what could, should, and ought to *be* while maximizing the diversity of input such that questions about "who decides" and "according to whom" can be answered from a more inclusive perspective.

## THE PROBLEM

Scenarios are being used in increasingly varying contexts, but

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little knowledge is being documented or shared in terms of the successes and failures of scenario planning in those contexts. In particular, scenarios are being used with increasing relevance in transitioning societies. Such societies are facing extreme turbulence and thus, need new ways of exploring plausible futures with an emancipatory aim. Scenarios have the potential to play a very helpful role in such transitioning societies, but the lack of examples and cases of success and failures leads to an oftentimes inefficient approach. Documentation of past successes and failures can provide important insights into new projects that attempt to provide relief for struggling communities and nations. This article intends to make the conceptual link between scenario planning and critical science research, advocating for the integration of these two processes to help oppressed or transitioning groups imagine a series of plausible futures that could be, should be, and ought to be. It is first, however, important to understand some background and the research approaches commonly used in oppressed and transitioning communities.

## ON THE CONFUSION AROUND 'CRITICAL'

Because of intense confusion regarding the differentiation of critical science, critical social science, critical science research and critical theory, the first task of this article is to provide some discussion around each. It is important to note that, even among critical social scientists, critical science researchers, and critical theorists, there is no agreement about the precise meanings of these divisions, and the potential overlap. Thus, this article will not attempt to provide a comprehensive view; rather, it will offer current thinking on each, with hopes of allowing the reader to draw lines of distinction. In addition, this manuscript provides the challenge for critical scientists, researchers and theorists to begin the search for common ground, and the specification of points of distinction and similarity. For the purposes of introducing this critical view of the world, the term "critical school" will be used in reference to a larger philosophical stance that includes all critical sub-groups.

After providing a frame of the critical school, this article will discuss its core elements, followed by two documented scholarly processes commonly used to conduct critical science research. In the interests of evaluation, a section covering the standards and criteria for good critical science research is offered. Once this view of critical science research is established, the links to the scenario planning process are discussed with key reference to the use of scenarios in this very fashion for considering a post-apartheid South Africa.

## A BRIEF INTRODUCTION TO THE 'CRITICAL SCHOOL'

The major goal of the critical school is to develop more complex ways of reasoning, facilitating a free society in which people construct questions and develop shared meanings that affect society, and uncover misunderstandings about the conduct of life (Carr and Kemmis, 1986). Further, the critical school seeks to come to a new understanding of social conditions so that oppressed people are emancipated (Carr and Kemmis, 1986; Comstock, 1982). The critical school is grounded in critical social theory and draws on theories of German philosophy, feminist literature, and largely on the work of Karl Marx (1887). The 1920s and 1930s saw members of the Frankfurt Institute of Social Research examining Marx's theory and questioning why it had not evolved completely. The Frankfurt School (Jay, 1973) was established as a group of researchers who sought to further the ideas of Karl Marx, and also to understand social phenomena that structure social hierarchies. Members of the Frankfurt School suggested several theoretical proposals to explain Marx's shortcomings, but these proposals were met with great resistance (Jay, 1973). It was Habermas (1971, 1973) who responded to these critiques of the Frankfurt Institute, and his responses form the basis of critical theory (Coomer, 1987).

## CRITICAL SOCIAL SCIENCE AND CRITICAL SCIENCE RESEARCH

An examination of Fay (1982, 1977), Coomer (1987, 1989), Comstock (1982), Freire, (1970), and Carr and Kemmis (1986) yields the conclusion that there seems to be no obvious distinction between critical social science and critical science research. Critical social science has been used as a general label for interventions and processes that begin by exposing a value system and that aim to establish equality or justice in a social system (Fay, 1987; Comstock, 1982). Critical science research has also become a standard title for such interventions, as they require a historical and philosophical understanding of the conditions that have led to the oppression of some group of people (Fay, 1987; Comstock, 1982). Critical social science and critical science research require that several elements are present in the social situation to be addressed. These elements will be discussed in detail along with some documented methods for conducting critical social science and/or critical science research. From this point forward, the terms critical social science and critical science research will be considered interchangeable, although this text will favor the latter label.

Paulo Freire (1970) is considered by many to be the father of critical science research. He worked primarily in South America and

was directly involved with the communities he intended to provide with the abilities and vision to change their oppressive conditions. His methods of conducting critical science research focused on an outcome of action and transformation with a crisp focus on application. Freire also explicitly developed the method of dialogue or dialogics as the primary means of practicing freedom (1970). Alternatively, Habermas (1971) focused on the development of critical theory, or explanations of social systems that are set up to privilege some groups and oppress others. Fay (1987) provided an analysis of the elements of a critical social science and essentially brought the active and theoretical elements together to form a basic scheme of critical social science, or critical science research.

## The Elements of Critical Science Research

Fay's (1987) analysis provided that the conditions for a social theory to be critical and practical are: (1) that there is a crisis in the social system; (2) that the crisis is caused, at least in part, by a false consciousness of those experiencing it; (3) that the false consciousness is amenable to the process of enlightenment; and (4) that enlightenment lead to an emancipation in which the group in crisis alters its social position and alleviates its suffering. In his construction of what makes for a critical theory, he argued that a fully developed critical theory would consist of: (1) a theory of false consciousness; (2) a theory of crisis, (3) a theory of education; and (4) a theory of transformative action. These four theories, according to Fay, are made up of 10 sub-theories when unpacked. However, definitions, or in depth discussions of terms—most importantly the term 'theory'—are not offered.

Given this description of a critical or social theory, the extent to which critical science is scientific seems questionable—although clearly some critical science researchers disagree. For example, Fay argued for the following definition of 'scientific': "those explanatory endeavors which seek to account for a wide range of phenomena on the basis of a few theoretical principles, and which do so in a way which is responsive to public, empirical evidence." This definition of scientific seems very similar to Dubin's (1978) notion. Clearly, however, the interpretations and the rigor of the interpretations are quite different. For example, Dubin's theory building process is intensely rigorous, relies on the specification of units, laws of interaction, system states, boundaries of the theoretical model, and all of this precedes any form of testing. The construction of 10 sub-theories according to Dubin's methods is simply impractical and points to differing interpretations of the given definition of 'scientific.' Given these kinds of discrepancies in definitions, it seems that the more explicit critical science researchers can be about their terms

and their methods, the more powerful and accepted their arguments will become. Most critical science research is not defined or described at a level of detail that replication could be completed and, while some critical science researchers agree that "explicit procedures may be of value at some point," (Strom and Plihal, 1989), we submit that point has arrived. Critical science asks very important questions and many researchers would support the explicit development of the tools used to answer them.

Fay's (1987) proposed elements of critical science research include: (1) crisis, (2) false consciousness, (3) enlightenment, (4) emancipation, and (5) dialogue. Each of Fay's elements of critical science research will be examined, and Freire's (1970) notion of dialogue has been included as the primary means of linking them together. Freire also advocated that dialogue was a method of *practicing freedom*—an important distinction and discussion in its own right. Fay's core contention was that, in order for any endeavor to be considered truly critical, these conditions or elements must be present.

*Crisis.* Fay defined a crisis as "the felt dissatisfactions of a group of people" showing "both that they threaten social cohesion and that they cannot be alleviated given the basic organization of society and the self-understandings of its members." Comstock (1982) expressed that a level of discontent is reached in some group in society in which "groups are progressive insofar as they express interests, purposes, or human needs which cannot be satisfied within the context of a social order characterized by material and ideological domination." In short, a crisis occurs when a group of people realizes that its needs are not and cannot be met by conditions as they are, and that group collectively seeks some resolution or change in social conditions that will allow them to meet their needs.

*False Consciousness.* Fay explained that, in critical science research, a false consciousness refers to the "ways in which the self-understandings of a group of people are false (in the sense of failing to account for the life experiences of the members of the group) or incoherent (because internally contradictory), or both." Burr (1995) equated the notion of false consciousness to that of ideology, stating: "This is the view of ideology as 'false consciousness'." The basic assumption underlying this view is that there is a real, material state of affairs but that people do not recognize this reality because it is obscured by widely accepted ideas and beliefs. In the critical view, a false consciousness is a set of beliefs that masks contradictions in society between manipulative economic forces and the needs of those who are disadvantaged.

*Enlightenment.* Fay described enlightenment as "raising the consciousness of the oppressed" (1987). Enlightenment sees the alteration of the false consciousness, and leads to the relief from

oppression. While providing such enlightenment is one core aim of critical science research, enlightenment refers to the education that must take place in order for a group in crisis to realize their liberation from oppressive social order (Held, 1980). Enlightenment is thought of as the educational component (Fay, 1987) that provides oppressed or disadvantaged groups with the insight that their situation may be unjust and that they can take action to provoke change.

*Emancipation.* Enlightenment leads to emancipation, or the situation in which "a group, empowered by its new-found self-understanding radically alters its social arrangements and thereby alleviates its suffering" (Fay, 1987). Emancipation is freedom from once oppressive conditions that instilled deep suffering in a group of socially disadvantaged people.

*Dialogue and Dialogics.* According to Freire (1970), "dialogue cannot occur between those who want to name the world and those who do not wish this naming—between those who deny others the right to speak their word and those whose right to speak has been denied them." Freire emphasized the view that dialogue is the primary means through which the world can be transformed and humanized. Freire also proposed that several elements are required for authentic dialogue to take place, including commitment, humility, faith in others, and hope.

### Summary

These elements, namely, crisis, false consciousness, enlightenment, emancipation, and dialogue, are all required for a social situation to be labeled as critical and to fit the need and scope of a critical response (Fay, 1987). These components form the basis of critical science research and include the assumptions required for defining a situation in which a critical frame, examination, or response is appropriate.

## CRITICAL THEORY

The key distinction to be noted for critical theory is that it stops short of action. While critical science research certainly makes use of, and sometimes develops, critical theory, the critical theorist is often found quite detached from the oppressed group of people about which a theory is being constructed (Horkheimer, 1972). Habermas (1971) was considered a formidable critical theorist, although he did not work directly with any oppressed group of people in attempts to work toward emancipation. Put simply, critical theory follows the same process as critical science research, but requires no action, only a theory about the oppressed, the evolution of their condition, and

sometimes recommendations for action, even though the theorist does not engage the social group in action (Lather, 1991).

For purposes of clarity, this important distinction is drawn between critical science research and critical theory. That is, linking critical theory and scenario planning is a relatively useless endeavor, as there is no cause or outcome of action. Critical science research, however, is *rooted* in social change. The application of scenarios in this context is advocated with a *focus on action* and is discussed in a later section that attempts to bridge the academic discussion offered here and provide its relevance for practice.

## OUTCOMES OF CRITICAL SCIENCE RESEARCH

There are two aims of critical science research: (1) fostering nonexploitive relations among people; and (2) discovering the central place of morally responsible people in the development of society (Comstock, 1982). Critical self-reflection brings about enlightenment and freedom from social control (Inglis, 1997). Knowledge produced from the critical perspective is emancipative. Knowledge is used to free individuals from oppressing forces in order to develop full individual potential. Critical science tackles two key ideas: (1) power and (2) action. Power is seen to be maldistributed and used improperly, and action is stressed as an outcome of the process (Lukes, 1974). Given these core aims, the critical science research question often focuses on moral and political justification, and these questions are often phrased in precisely this way: What morally and politically justified action should be taken with regard to X?

### The Critical Science Research Process

Comstock (1982) provided a seven-phase method of critical science research: (1) identify movements in social groups; (2) develop an interpretive understanding of the group and the intersubjective meanings, values and motives; (3) study the historical development of the social conditions and current social structures; (4) construct models that determine relationships among conditions, interpretations, and participant actions; (5) make explicit the fundamental contradictions: compare conditions with understanding, critique the ideology, and discover possibilities for action; (6) participate in a program of education or a planned activity to help the group see another way; and finally (7) return to step 2.

Comstock clearly intended for critical science research to be an iterative process in which the researcher returns again and again to the group with which he or she is working to develop an intersubjective understanding of the situation in question. Although there is a subjectivity required in transitioning from each step to the next,

Comstock provided a basic guide within which the critical science researcher can begin to work that incorporates many of the requirements for critical theory discussed by Fay (1987).

Fay argued for a general three phase process of critical science research, namely, (1) enlightenment, (2) empowerment, and (3) emancipation. This general process of critical science research is not precise enough for replication to any specific outcome ends; however, it does provide the researcher with a general frame, useful, perhaps, as a base on which to found other, more detailed methods.

Ideology critique is *one* tool used within the critical science research process that intends to establish and define the biased social situation in which one group of people is granted a social advantage at the expense of another. A diagnostic tool of sorts, the general process of critiquing an ideology follows four steps, namely, (1) identification of the ideology under examination; (2) development of the norms around the ideology; (3) identification of the consequences that follow from those norms; and (4) examination of the actual existence of the ideology and practices pertaining to it (Jay, 1973).

A critique of ideology as offered by the Frankfurt School was intended to expose and disclose the hypocrisies, inconsistencies and contradictions that so many Frankfurt theorists saw in empirical approaches to knowledge. A critique of ideology is commonly used in critical science research as a means of determining the biased and non-objective social system that is operating.

As a core tool of critical science research, Burbules (1995) examined five forms of ideology-critique. The first and most common form is a scientific or rational critique. In this form, ideologies are evaluated on the basis that they meet features of rational discourse such as factual information, logical arguments, and distortion of the truth, among others. The second form, immanent critique, challenges a belief system by comparing it to itself and checking for consistency between what the belief system purports to be true, and then evaluating it against its own criteria. A third form is deconstructionist, in which the notions of truth, fact, evidence and objectivity are rejected. In this view, it is unclear, as even Burbules admits, "whether this stance can support a notion of ideology-critique." A fourth form of ideology critique is called an argument from effects, in which belief systems are viewed in socio-political contexts and that "have consequences within the dynamics of that context." Finally, the fifth form of ideology critique examined by Burbules is one in which the researcher must provide a counter-ideology with which to confront the ideology that is being critiqued. The counter-ideology approach has been viewed as potentially manipulative as it proclaims that one way of thinking is superior to another.

## Criteria for Good Critical Science Research

In critical science research, reliability, internal and external validity, and generalizability are generally considered inadequate and inappropriate measures for success (Smith, 1993; Turnbull, 2002; Denzin and Lincoln, 1994), and are replaced with the notions of trustworthiness, credibility, transferability, and confirmability (Turnbull, 2002; Guba and Lincoln, 1998). Standard measures of success in critical science research include intersubjective validity established through dialogue with subjects—engaging them in self-conscious action (Comstock, 1982), and of course, emancipation and social change are considered results of self-conscious action.

Intersubjective validity is a term that has implications for the issue of evaluation criteria at three levels. "That is, a valid study must accurately depict how people understand their own situations, assess those understandings for correctness in terms of objective historical conditions, and, if they are distorted understandings, inspire people to empower and emancipate themselves" (Smith, 1993). According to Smith, there are four general criteria:

1. reflexivity
2. collaboration
3. the elucidation of historical conditions
4. transformation.

The extent to which these four criteria are demonstrated are the extent of the validity of the study (Smith, 1993). Brown (1989) offered another set of standards for evaluating critical science inquiry, namely, (1) the research addresses a question of how certain individuals or groups can be freed through reason and evidence from a particular systematic misunderstanding (ideological belief), (2) the research identifies an observed systematic misunderstanding (which exists in fact) and documents its existence, (3) the research presents a criticism of the particular misunderstanding by showing how, as ideological belief, it supports a certain unjust social situation, (4) a coherent explanation of the particular misunderstanding is provided in the historical-social situation that initially caused the distortion, (5) the research constructs an alternative to the misunderstanding for consideration to its intersubjective validity, (6) suggestions are made as to how the individuals or groups involved can act as a possible (but not the only) alternative to change the frustrating social reality, and finally (7) the research reflects the researcher's competence in communication.

Two evaluative techniques for critical science research have been provided and discussed in brief. The nature of critical science research requires that the phenomenon direct the evaluative effort in

conjunction with the social group involved in the research process. Further, the ultimate basis of judging the effectiveness of critical science research is in the alleviation of the false consciousness, and thereby the suffering of a group of people.

## THE PROPOSED LINK TO SCENARIO PLANNING

The core arguments presented in this paper are that scenario planning can be an emancipatory process, and that scenario planning can be used as a critical science research tool. Ogilvy (1996) posited scenario planning as the fulfillment of critical theory, citing a paradigm shift in the human sciences away from a predictive and value-neutral method of inquiry, and arguing "I would like to enlist the tools of alternative scenario development in the service of moral outrage at past and present social conditions." This article is intended to go one step further, and acknowledge that scenarios and scenario planning can play an important role in the critical science research process by addressing Fay's (1987) elements of critical science research, namely, (1) crisis, (2) false consciousness, (3) enlightenment, (4) emancipation, and (5) dialogue.

*Scenarios* have been defined as "a tool for ordering one's perceptions about alternative future environments in which one's decisions might be played out. Alternatively: a set of organized ways for us to dream effectively about our own future" (Schwartz, 1991). *Scenario planning* has been defined as "a process of positing several informed, plausible and imagined alternative future environments in which decisions about the future may be played out, for the purpose of changing current thinking, improving decision making, enhancing human and organization learning and improving performance" (Chermack and Lynham, 2002). Scenarios are also used as building blocks for designing *strategic conversations*—dialogue within the organization that leads to continuous organizational learning about key decisions and priorities (Schwartz, 1991).

### Normative Scenarios

It is important to acknowledge a shift in the type of scenarios employed in a process with such goals as those that have been described in the critical frame. For example, computer generated, algorithmic scenarios are not likely to aid in establishing an intersubjective understanding (Georgantzas and Acar, 1995) among any group of individuals. Thus the scenarios that are likely to be helpful in this situation are inherently normative, i.e., they are value laden. Ogilvy (1996) provided three key philosophical links between scenario planning and the critical school. The critical school provides a frame in which moral values and passion are considered re-

quirements for viewing the world in a holistic manner. In addition, the critical frame provides a bias toward action, which is appreciated in strategic contexts and finally, the fact that the Frankfurt School sought to provide a voice for all of humanity implies a resulting social change "not for the sake of narrow, special interests" (Ogilvy, 1996). Contrary to the use of empirical scenarios in business planning, normative scenarios *require* the input of human values for the consideration of what the future *should* be.

Scenario planning is also being increasingly applied in settings other than business planning (Ringland, 2002; Ogilvy, 1996; Kahane, 1994, 1992). Schools, communities and nations are making use of this valuable tool to explore potential futures and cope with alarming uncertainty. For example, Ringland (2002) reviewed case studies of scenario planning applied to Turkey at a national level, and to the healthcare industry. Sagar (2001) conducted a scenario project around the potential developments in biotechnology. Further, Elkington and Trisoglio (1996) explored potential futures of environmental concerns and shifts through scenario planning. The Global Business Network is constantly applying scenarios in a variety of settings and openly shares descriptions of its projects at www.gbn.org. These diverse settings particularly lend themselves to viewing scenarios and scenario planning from a critical perspective because they imply a power differential in which a group of people makes decisions that will affect many.

## AN EXAMPLE—SCENARIOS OF A FREE SOUTH AFRICA

An example of normative scenarios and scenario planning used in a national setting, and from a critical frame, were those scenarios used in South Africa prior to the end of apartheid. In 1992, a diverse team of exceptional thinkers gathered in South Africa to consider the future of the country. The exercise was sparked in 1991 by concern over the future of virtually all aspects of the country's operation. Economist Pieter Le Roux suggested the organization of a conference exploring South Africa's future economic options in light of considerable change. At the time, Le Roux was the Director of the Institute for Social Development at the University of Western Cape. Considering several recent conferences covering similar topics, Le Roux decided it was time for a different approach.

Twenty-two people from various disciplines were gathered to construct scenarios for the future of South Africa. The team included business people, academics, politicians, and unionists, among others. This team became known as the Mont Fleur scenario team. Adam Kahane, then the head of planning at Royal Dutch/Shell oil company and a recognized expert in scenario construction, facilitated the project. The team met for three sessions, the final one in March of

1992. The team analyzed the social, technological, economic, environmental and political crises and compiled 30 possible "stories" about plausible courses of events over the next decade. The scenarios offered descriptions of plausible futures for South Africa and were intended to stimulate debate. The 30 stories were checked repeatedly for plausibility and internal consistency. Nine of the 30 were selected and then further refined, scrutinized and collapsed into four final scenarios. The team emphasized that the future of the country would be shaped by decisions that might be made as a result of intense dialogue elicited by the scenarios. The title "Mont Fleur Scenarios" was adopted to indicate the meeting location of the group instead of a specific institution or organization.

## Scenarios and the Elements of Critical Social Science

Each element of critical science proposed by Fay (1987) has links and implications when coupled with scenario planning. These elements are inherently addressed through scenario planning, particularly when using a normative approach. In this section, how scenario planning incorporates or addresses each element will be discussed, with reference to the application of normative scenarios in South Africa.

*Crisis.* Scenario planning addresses crises by its very nature. While increasingly being advocated as a tool that is most effectively applied continuously, most writings that deal with the process of scenario planning indicate a central concern, issue or problem to be addressed (Schwartz, 1991; Shoemaker, 1995; van der Heijden, 1997). It could be argued either way that business issues fulfill or do not fulfill the proposed definition of crisis—a group of people finding that their needs are not being met due to social positioning—however, some have labeled the constant state of change itself a crisis (Fahey and Randall, 1998).

Other contexts, for example, the shift to community and national settings, almost always incorporate issues that could be defined as or could quickly lead to the status of a crisis (Fahey and Randall, 1998). Scenarios applied in South Africa to examine a post-apartheid nation were most certainly conceived in a position the participants would have labeled a crisis (Kahane, 1994, 1992). A number of experts have advocated utilizing scenario planning as a form of contingency planning in hopes of purposefully avoiding crises.

*False Consciousness.* Scenarios allow participants to explore multiple sets of assumptions about the world and its possibilities (Senge, 1994). Given this, a core aim of scenario planning has been stated as follows: "the most important purpose of the scenario building process is to shift the thinking of the leadership inside the organization about what might happen, in the future, in the external

environment" (Wack, 1985a). The American Heritage Dictionary (2002) defines an ideology in the following two ways: (1) the body of ideas reflecting the social needs and aspirations of an individual, group, class, or culture, and (2) a set of doctrines or beliefs that form the basis of a political, economic, or other system. And, if critical science allows the equation of ideology and false consciousness (Burr, 1995), a core aim of scenario planning is to provide alternative ideologies about how the world might be. This is particularly so with the use of normative scenarios driven by the values of those constructing them.

Logically, scenarios are also safe places to experiment with changing ideologies. For example, racial relations in South Africa were based on an ideology that was, for many, instilled since birth. Right or wrong, South Africans of all races had no idea what to think or feel about the upcoming changes and power shifts in their country. Scenarios gave them a place to explore what it might be like and how they might cope with a radically altered social belief system.

*Enlightenment.* By providing a view of the future in which oppressive conditions have been changed, scenarios allow people to imagine worlds in which their situation is dramatically different. As educational tools, (van der Heijden, 1997) scenarios allow participants to identify their false consciousness and examine how things might be different. Chermack and van der Merwe argue that scenarios allow individuals and organizations to construct their own futures. Enlightenment is "the means whereby the members of its audience can come to see themselves in a radically different way from their current self-conception" (Fay, 1987). As such, scenarios are an important means for people to do just that. Understanding the past helps us to understand the present, as does understanding plausible futures.

The scenarios used in South Africa allowed participants and the nation to experience, if only in their imaginations, radically different conceptions of themselves in a nation free of the once strict boundaries they knew only too well. South Africans were encouraged to learn from what they imagined, and the false consciousness of so many was made terribly obvious.

*Emancipation.* A core assumption embedded in the scenario planning process is that participants will make decisions differently as a result of what they learned through playing out different plausible futures (Schwartz, 1991). Chermack and Lynham (2002) advocated that one key outcome of the scenario planning process is improved decision-making capabilities. Implied by this outcome is the notion that conditions and environments will also improve. In normative scenarios that explore contexts broader than those used in business, these conditions and environments are often communities,

nations, and sometimes even the entire globe (Ogilvy, 1996). It is through improved decision-making that individuals and groups can take actions that improve their conditions (Ogilvy, 2002).

Scenario planning is inherently an educational process (van der Heijden, 1997). With a core aim of altering current ways of thinking about the future, or mental models, learning is required for the necessary transformation in thinking to occur. Wack (1985a) stated: "Strategies are the product of a worldview. When the world changes, managers need to share some common view of the new world. Otherwise, decentralized strategic decisions will result in management anarchy. Scenarios express and communicate this common view, a shared understanding of the new realities to all parts of the organization." This new world view can be one in which suffering has been alleviated and emancipation realized.

South Africa is currently in turmoil. While some scenarios posited a radical power swing in the previously unfavored direction, the extent to which the current situation was explored is unclear. However, those who were once socially disadvantaged by national policy are certainly not in the same position. Currently, poverty tops the list of prevalent issues in South Africa.

*Dialogue and Dialogics.* The primary medium through which scenario planning takes place is dialogue. Scenario planning requires extensive interviews, brainstorming, discussion, debate, and conversation. In addition, the process frequently makes use of "remarkable people" or those without stock in the issue under consideration, often people unrelated to the domain of the issue (van der Heijden, 1997). The use of such people challenges the mental models in operation and provides insight from very diverse backgrounds. In addition, van der Heijden discussed the notion of a "strategic conversation," which portrays the essence of an ongoing dialogue long after the project's conclusion, about common experiences of the future through scenarios.

## Scenarios and the Critical Science Research Process

A core intent presented in this manuscript is the notion that the critical science research process and the scenario planning process can be combined. Scenario planning is increasingly applied in more diverse settings according to more diverse methods (Chermack, Lynham, and Ruona, 2001; Ringland, 1997; Georgantzas and Acar, 1995). This state of practice displays a general lack of consistency in applying the scenario planning process. Given this, there are no documented studies or cases that follow the critical science research processes described herein.

## Evaluating Scenarios Applied in a Critical Frame

Scenario planning is not well-evaluated in any of the contexts in which it is currently applied. Considering the high costs associated with this intense planning process, a thorough scheme of evaluation is recommended, focusing on changes due to altered thinking, improved decision-making and improved financial performance (Chermack, Lynham, and Ruona, 2001). However, scenarios used in the critical frame should also incorporate the elements advocated in critical science research. Smith's (1993) criteria of (1) reflexivity, (2) collaboration, (3) the elucidation of historical conditions, and (4) transformation are all within the scope of the practitioner to evaluate and some are inherent in the process itself.

Scenario planning is an iterative process (Ringland, 2002, 1998; Schwartz, 1991) and, done effectively, it requires reflexivity and critical thinking about issues prevalent in the context and organization participating in the process. Collaboration is also required for the process to proceed past its initial stages because it simply cannot be completed through the efforts of a few individuals. Historical conditions are core to the consideration of organization position and any potential future situation, as is transformation. Lave and Wenger (1991) demonstrated that individuals or groups thinking differently as a result of some experience choose differently in light of their gained information. Finally, scenario planning avoids the need for consensus. By being indifferent to getting the future right, scenario planners urge participants to explore the possibilities, not conform to the predictions of a few. Thus, intersubjective agreement (Smith, 1993) need only consist of the view that the future can be different from the present. However, shared mental models (Doyle and Ford, 1998) or common views and value systems about the future are commonly generated through participation in scenario planning (van der Heijden, 1997; Wack, 1985a).

An example of difficulties convincing managers of the implications gleaned from the scenario planning process is found in scenario work at Daimler-Chrysler (Ringland, 2002; Shoemaker, 1993). Scenarios used at Daimler-Chrysler Aerospace revealed some key signs of the merger between Boeing and McDonnell Douglas, but higher levels of management did not take the early warning signs seriously. In this case, management was not involved in the project and project coordinators suggested that the lack of communication and dialogue contributed to a failure to take action. Thus, a lack of intersubjective agreement or communication between levels of management led to the failure of higher-level managers to consider the improbable—which actually occurred.

## From Theory to Practice

Thus far, this article has advocated for the use of normative scenarios in critical science research. This article can also be viewed from the perspective that scenario planning in nation and community building contexts can draw from the tools and approaches used in critical science research. This article has also provided an almost purely academic perspective. The conceptual links that have been made here have multiple implications for practice, such as how best to initiate scenario planning projects in settings involving socially disadvantaged groups of people, and how decisions might be made within such projects. In addition, there are obviously ethical considerations about any researcher working with such a group. While the primary intent of this article is to explore the conceptual link between scenario planning and critical science research, some practical issues and questions must be raised for discussion.

A prime and relevant situation involves Iraq. Scenarios could be used to explore the future of the country and its many complicated affiliations. However, questions about which government or governments should sponsor such an effort, and who, ultimately would have control of the project are difficult to answer. In the context of the academic discussion offered in this article, the most appropriate team would include the primary stakeholders and involve the opinions, concerns, hopes, dreams and fears of the Iraqi people. Thus, the project would involve politicians, business people, religious advisors, and those with a stake in the future of the country and credibility in the community. The point of using scenarios to explore the future of Iraq would ultimately be a dialogue among Iraqi people about the best future for their own country and exploring their future in a way that helps them shed an oppressive ideology. Therefore, a fundamental shift in thinking would not be 'told to the Iraqis'—rather, they would create it themselves.

A key further question involves the expertise in conducting scenario planning. While there are increasing numbers of consulting firms offering scenario planning services, few have a track record of success in community and nation building settings. Fewer still have documented their projects in ways that allow expertise to be transferred easily. The Global Business Network, however, has provided reports of its activities in such contexts, which are available on its Web site (www.gbn.org) for download. Ultimately, expertise in scenario planning techniques is required, and thus an additional problem is revealed for disadvantaged groups or nations like Iraq. Two obvious solutions include volunteer work by those with such expertise, and training some of those in the socially disadvantaged group in contemporary scenario planning techniques.

The fact that that there are no easy answers to these questions

should serve as testament to the fact that further documentation and knowledge sharing about scenario planning in critical contexts is needed. Only through careful study and dissemination will we be able to find the most efficient ways of addressing the complex issues and questions raised by implementing scenario planning in such situations.

## SUMMARY AND CONCLUSIONS

This article has attempted to provide the links between scenario planning and critical science research. The use of normative scenarios to explore future conditions that see the alleviation of suffering and the granting of emancipation for groups of socially disadvantaged people is a noble effort with incredible potential. While this article is in no way a conclusive discussion of scenarios used in a critical frame, it does provide the basis for further inquiry into the application of scenarios in emancipatory contexts. Scenarios used in South Africa have been highlighted as an example of such potential, and Fay's (1987) elements of critical science research have been addressed through the scenario planning process. Suggested further research considerations include case studies of scenarios used in this context, and further comparison of scenario planning and critical science research as the details and rigor of method in critical science research become clear.

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