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SCIENCE OF CULTURE AND CULTURE OF SCIENCE
Worldview and Choice of Conceptual Models & Methodology[1]

Dharm P. S. Bhawuk*

Worldview is shaped by culture, and worldview directs the choice of conceptual models, research questions, and what we do professionally as a social scientist. Cross-cultural researchers, by virtue of being both scientists and cultural scholars, are well suited to examine the interaction between the culture of science and other indigenous cultures, and examine the human value system in the context of this dynamic interaction. This paper attempts to do this by contrasting the Indian cultural worldview against the culture of science. Research on Transcendental Meditation (TM) is presented as a vehicle to examine the interaction between Indian cultural worldview and what is called scientific thinking. Implications of such interactions for studying human value system for cross-cultural researchers are discussed.

Worldview shapes what is "interesting" (Davis, 1971) to a great extent to a particular audience, what is considered a problem, what problem is interesting to study, and whether the goal of studying a problem is to analyze the problem, to analyze and solve the problem, or to analyze, solve, and implement the solution. Davis argued that all theories in social sciences become false over time, because they are simplifications of reality. He contended that some social science theories are less false than others are. Theories are accepted in social science because they are "interesting," and they persist because of their interestingness, sometimes even after they are refuted. Davis' ideas are provocative, and they have great significance in that culture shapes what is considered interesting to a great deal. For example, though western researchers do not consider spirituality an important research topic, it is of great interest to Asian scholars. Davis himself falls into the cultural trap when he concludes that all of the propositions that he examined were interesting only if they negated an existing one. This itself may be an aspect of western culture. There lies the threat, even for cross-cultural researchers, in that they may make the mistake of studying concepts that are interesting (only!) from their own cultural perspective.

Research by Nisbett, Peng, Choi, & Norenzayan (2001) indicates that cognitive processes differ across cultures in fundamental ways (e.g., in the process-content distinction) because they are shaped by different social systems. Nisbett et al. found East Asians to be holistic in their causal analysis and dialectic in reasoning, whereas Westerners are more analytic and tend to use formal logic. Thus, worldview shapes our cognition, and culture shapes our worldview. Our worldview not only directs the choice of conceptual models, research questions, and methods of inquiry (Danziger, 1990), but also

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1 *Author's Note: An earlier draft of this paper was presented at the XVth Congress of International Association for Cross-Cultural Psychology, Poland, July 16-21, 2000, and it has not only gone through many revisions since then but also become the foundation for my program of research on indigenous psychology. This paper is dedicated to Professor Ian I. Mitroff whose work inspired me to question the scientific method systematically*

* *Professor of Management and Culture and Community Psychology, Shidler College of Business, University of Hawaii at Manoa, 2404 Maile Way Honolulu, HI 96822, USA*

what we do professionally as social scientists. We are all also shaped by the culture of science, which is founded on rationality and empiricism. Cross-cultural researchers, by virtue of being both scientists and cultural scholars, are well suited to examine the interaction between the culture of science and other indigenous cultures, and examine human behavior in the context of this dynamic interaction. This paper attempts to do this by examining the Indian culture vis-à-vis the culture of science. First the thesis that science has a culture is laid out by recognizing the defining attributes of science. Then the Indian worldview of who we are and what we should be doing is presented, followed by an examination of how this view interacts with the culture of science and what is called scientific thinking. Implications of this interaction for studying human value system for cross-cultural researchers are examined.

Culture of Science

When we discuss the basic tenets of science, or the culture of science, we must keep in mind that the culture of science, like any other culture has evolved over the years, and some of its elements were more prominent at some point in time, and then lost their value to some other elements. Probably the earliest conflict in value that scientists faced was about being objective versus subjective, about being impersonal versus personal. Through a long struggle, science has established objectivity and impersonalness as its basic tenets, though it has not been an easy journey, even for science.

> There has always existed set of antitheses or polarities, even though, to be sure, one or the other was at a given time more prominent– namely between the Galilean (or more properly, Archimedian) attempt at precision and measurement… and, on the other hand, the intuitions, glimpses, daydreams, and a priori commitments that make up half the world of science in the form of a personal, private, "subjective" activity (Holton, 1973, p. 375).

Scientists share a worldview, which assumes that "science rejects the indeterminate" (Bernard, 1957, p. 55). When it comes to methodology to solve difficult problems, they believe in breaking down the problem in smaller parts and studying them in pieces.

> When faced by complex questions, physiologists and physicians, as well as physicists and chemists, should divide the total problem into simpler and simpler and more and more clearly defined partial problems. They will thus reduce phenomena to their simplest possible material conditions and make application of the experimental method easier and more certain. (Bernard, 1957, p. 72).

Thus, science rejects the indeterminate, and scientists are objective, impersonal, and believe that the world can be partitioned into smaller parts where the total is simply the sum of the parts. For this reason, scientists are criticized to be reductionists in their approach in examining and solving problems.

A scientific observation is only valid if two trained observers can come to the same conclusion, i.e., arrive at an agreement, about a phenomenon independent of each other. Campbell defined science as "the study of those judgments concerning which universal agreement can be reached (Campbell, 1952, p. 27)." Mitroff and Kilman (1978) argued that consensus building is one of the epistemic foundations of science, and they categorized scientists who believe in this as the "analytic scientist." They criticized this approach to science by raising questions about lack of agreement on the meaning of the terms, "judgment," "universal," "agreement," and "study." They posited that it was possible to have disagreement, yet do scientific studies in social science, and questioned why science could not be founded on disagreement. Criticism aside, science is characterized by scientists' belief in creating agreement among them about what "truth" is. For example, physicists would create agreement about what gravitation is, what latent heat of evaporation is, and so forth.

Psychologists would create an agreement, for example, about how a person with a certain personality type is likely to behave in a certain situation. Management scholars might attempt to create agreement about what is an effective strategy under rapid or slow changes in the environment.

Another foundation of science lies in the belief that science is value-free, and scientific knowledge comprises impersonal facts from which disinterested theories are constructed. Though both the impersonal nature of facts and the disinterested nature of theories are found to be lacking in science (Churchman, 1961; Kuhn, 1962; Mitroff, 1974; Rander & Winokur, 1970), social scientists generally believe them to be the characteristics of science. Three other important characteristics of science are: precision, accuracy, and reliability (Rosenthal & Rosnow, 1991). It is believed that science creates unambiguous knowledge by measuring facts with precision, describing findings accurately, and following procedures (or using instruments) that are reliable. These three characteristics serve as the foundation of experimental work in science as well as in the social science. This necessarily leads to studying facts and events that are quantifiable, measurable, and manipulable. If precision, accuracy, and reliability cannot be used, no scientific study can be carried out.

Science also regards logic as something basic. For example, The Law of Contra-diction, i.e., no proposition can be both true and false at the same time, and The Law of Excluded Middle, i.e., every proposition is either true or false, are taken as axioms, something that is irrefutable. If these fundamentals are contradicted then the experience or fact itself is to be labeled as distortion or error (Mitroff & Kilman, 1978). Scholars have criticized this notion for some time. For example, Haack (1974, p. 15) argued that at least in principle logic should not be viewed as infallible and absolute, "… none of our beliefs, the laws of logic included, is immune from revision in the light of experience. According to this view it is at least theoretically possible that we should revise our logic."

Mitroff & Kilman (1978, p. 53) concluded that "in order to label something a scientific theory, we must be able to cast it into a logical form so that given the proper antecedent conditions (X, A), we can make a valid deduction (Y)." They further stated that what is generally accepted as scientific requires that all scientific theories follow this form of reasoning, and whatever does not fit this cast is dismissed as nonscientific.

Dewey characterized scientists as having "an obsessive quest for certainty" (Dewey, 1960, p. 244), and blamed them for pursuing certainty to the degree that they ignore the inherent uncertainty in natural processes. Thus, pursuing certainty in the face of inherent uncertainty is another defining attribute of science. We find this pursuit of certainty in the work of Campbell and Stanley (1969), who presented eight threats to internal validity in establishing whether a certain variable is the cause of an outcome (X causes Y). Their work has become the foundation of research methodology in social sciences, and goes without much criticism. However, some scholars have questioned whether there are other sets of criteria that are equally meaningful. For example, Mitroff and Kilman (1978) examined these criteria and concluded that there are other desirable criteria that can be used to conduct a study, including experimental designs. They argued that avoiding these eight threats necessarily leads one to the control-group-experimental-design as the only viable research method for doing scientific research. They raised an interesting question, whether the same experimental design would be selected if other research criteria were used, and posited that there are indeed alternative sets of criteria that can be used to conduct research, and that these alternative criteria did not lead to the experimental design. They, thus, concluded that "selection of any particular experimental design is not automatic but is a function of one's *worldview* [emphasis

added] as well as a response to particular technical require-ments" (Mitroff & Kilman, 1978, p. 47).

Argyris (1968) presented a severe critique of the traditional controlled experimental design on two grounds. First, he argued that the controlled experiment is tyrannical much like the assembly line where workers have no control over their work. He argued that under such repressing settings the subjects often withdraw psychologically from the experiment and give wrong answers. The second ground for criticism deals with generalizability, and he argued that the findings from such experimental settings cannot be generalized to the real world, and can only be valid for similar repressive settings.

Champions of science glorify it on many counts. Some argue that science is the most fundamental of all disciplines, and only science, not art or literature, offers continuous progress, so much so that human progress entirely depends on it (Sarton, 1962).

> In almost every case wherever there is progress or a possibility of progress, this is due to science and its applications. I would never claim that science is more important than art, morality, or religion, but it is more fundamental, for progress in any direction is always subordinated to some form or other of scientific progress (Sarton, 1962, p. 45).

To summarize, we can say that science is characterized by rejection of the indeterminate, objectivity, impersonalness, and the belief that the world can be partitioned into smaller parts where the total is simply the sum of the parts. Science is about creating agreement among scientists about what "truth" is. Science is value-free, and scientific knowledge comprises impersonal facts from which disinterested theories are constructed. Scientific method requires precision, accuracy, and reliability. Science pursues certainty, and uses The Law of Contradiction (i.e., no proposition can be both true and false at the same time, and The Law of Excluded Middle (i.e., every proposition is either true or false). Science strives to get at the cause of certain outcomes, and follows the logic, "given the proper antecedent conditions (X, A), we can make a valid deduction (Y)." Practitioners of science believe that it is the most fundamental element for progress. Thus, these characteristics define the cultural boundaries of science. Since science is defined as everything rational, this may be the only known culture that has a definitive boundary.

The Indian Worldview

In this section an attempt is made to present a sketch of the Indian worldview. First, the classical worldview from the Upanishads is presented. Then, with the help of ideas from the Bhagavad-Gita, a consequence of such a worldview is discussed to highlight how worldviews influence what we value and how we study it.

Indian Worldview from the Upanishads

> Those who worship *avidya* (ignorance or rites) enter into blinding darkness; but those who are engaged in *vidya* (knowledge or meditation) enter into greater darkness (9). They say that by *vidya* a really different result is achieved, and they say that by *avidya* a different result is achieved, thus have we heard the teaching of those wise people who explained that to us (10). He or she who knows these two, *vidya* and *avidya*, together, attains immortality through *vidya*, by crossing over death through *avidya* (11). (Gambhira-nand, 1972, pp. 18-19).

We can see that the Indian worldview is quite alien to the scientific culture. In the ninth verse *avidya* and *vidya* both are said to lead to darkness, and *vidya*, the good knowledge, is said to be more damning than *avidya*, the "bad" knowledge, which in itself is contradictory in that how can good be worse than bad? In the tenth verse wise people are quoted to state that

avidya and *vidya* serve different functions. And then in the eleventh verse those who know both *avidya* and *vidya* conjointly are said to be wise, because they use one to pass over death, and the other to attain immortality.

It is the logic that I am drawing attention to, without getting embroiled into the question whether humans can ever achieve immortality. Wise people of India could partition the world in opposites, then put them together into one whole, and then again partition them. People who have a worldview that can deal with such a system of logic and concepts are likely to choose different problems to study, define problems differently, and then use different methodology to study those problems. We see this unique Indian logic system repeated in the next three verses of the same *Upanishad*:

> Those who worship the *asambhuti* (Unmanifested, prakriti, or non-becoming) enter into blinding darkness; but those who are devoted to the *sambhuti* (Manifested, becoming, Destruction, or *Hiranyagarbha*) enter into greater darkness (12). They spoke of a different result from the worship of the Manifested, and they spoke of a different result from the worship of the Unmanifested - thus we have heard the teachings of those wise people who explained that to us (13). He or she who knows these two - the Unmanifested (non-becoming) and Destruction (*Hiranyagarbha*) - together, attains immortality through the Unmanifested, by crossing death through Destruction (14). (Gambhiranand, 1972, pp. 20-22).

The classical western logic system, which is the foundation of scientific thinking, is unable to accept "X" and "Not X" both as true. In the *Upanishadic* literature, however, we find that people are very comfortable with practicing both "X" and "Not X" simultaneously, and X plus Not X does not become zero, instead it becomes what could be labeled infinity. Therefore, *vidya* and *avidya* or *sambhuti* and *asambhuti*, the opposite of each other, together lead to immortality. In the Upanishads we find more examples of this way of thinking.

> I do not think, "I know (*Brahman*) well enough." "Not that I do not know: I know and I do not know as well." He among us who understands that utterance, "not that I do not know: I know and I do not know as well," knows that (*Brahman*) (2). It is known to him to whom it is unknown; he does not know to whom it is known. It is unknown to those who know well, and known to those who do not know (3). (*Kena Upanishad*, Canto 2, Gambhiranand, 1972, p 59, 61).
>
> While sitting, It travels far away; while sleeping, It goes everywhere. Who but I can know that Deity who is both joyful and joyless (II, 21). This self cannot be known through much study, or through the intellect, or through much hearing. It can be known through the Self alone that the aspirant prays to; this Self of that seeker reveals Its true nature (II, 23). The discriminating man should merge the (organ of) speech into the mind; he should merge that (mind) into the intelligent self; he should merge the intelligent self into the Great Soul, he should merge the Great Soul into the peaceful Self (III, 13). (Katha Upanishad, Canto 2-3, Gambhiranand, 1972, p 146, 148, 164).

It should be noted that the Indian worldview is somewhat similar to what Mitroff and Kilman (1978) categorized as the "conceptual theorist," people who try to make a determination of the right versus the wrong schema by comparing two means-end schemas against each other, quite the opposite of the traditional scientific approach in which people select one single best explanation within a single means-end schema.

Consequences of the Indian Worldview

Sinha and Tripathi (1994) found that Indians were both individualistic and collectivist in their cognition, and suggested that it may be inappropriate to label the Indian culture as collectivist. To understand the self and resolve

such contradictions it may be necessary to examine the self in the indigenous cultural view of the world. Bhawuk (1999) presented the Hindu worldview of the self (see Figure 1), which clearly departs from the independent and interdependent concepts of self (Triandis, 1989, 1995; Marcus & Kitayama, 1991). In this indigenous worldview, self is surrounded by maya, which is transient and deceptive. *Maya* is defined here as the sum total of objective world and the socially constructed world. It is easier to visualize the socially constructed world as *maya*, since what is constructed in a certain time period changes over time, and is, thus, transient. The rationalist mind, Western and Eastern, can more readily accept the concept of *maya* as social construction of reality (Berger & Luckmann, 1967; Gergen, 1999; Neimeyer, 2001), especially with social scientists who deal less with the objective world, and more with subjective culture (Triandis, 1972), which is socially constructed and impermanent, and always "false" in the long-run, as Davis (1969) argued.

The objective world is so concrete that many people have serious reservations about accepting it as maya. Newtonian physics has contributed tremendously to this worldview. However, research in particle physics has led physicists to abandon the Newtonian concept of matter being definite and concrete, which can be defined by location, velocity, energy, and size (Hagelin, 1998). The Heisenberg principle of indeterminacy has led to the idea that nature is in some cases unpredictable, and scholars doubt that materialism can claim to be a scientific philosophy (Koestler, 1978). Also, an examination of the most accepted model of cosmology, the inflationary big bang theory (Guth, 1997; Linde, 1994), points in this direction. Stenger (1999) argued that science does not need to believe, consistent with most recent scientific theories, that the universe was created by God. Instead, it is plausible that "the universe tunneled from pure vacuum (nothing) to what is called a false vacuum, a region of space that contains no matter or radiation but is not quite nothing (Stenger, 1999)". Leaving aside the issue whether God created this universe or it emerged on its own, in the emerging worldview from the big bang theory it could be argued that maya not only includes the subjective world that we create but also the objective world with which we interact.

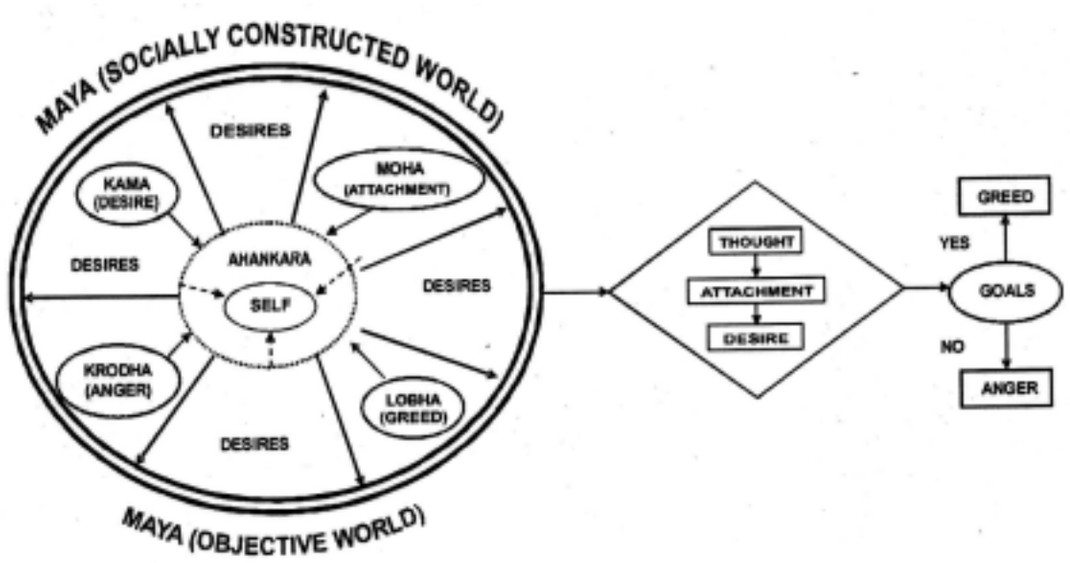

Figure-1 : Happiness in the Indian Worldview

Self tends to interact with *maya* because it is attracted by it, and, in the Hindu worldview, this interaction is the source of all human misery. The interaction of self with maya and conceptions of how one should deal with it show clear cultural variation. It is apparent that the Western psychology has focused on individual's goals, goal achievement, and the need for achievement. Indigenous Indian psychology, on the other hand, as a consequence of the Indian worldview, has focused on self and its interactions with the world through desires, controlling desires, and attaining personal peace. In indigenous Indian psychology, therefore, tremendous emphasis is placed on how to deal with, even eliminate, desires, whereas we find that in Western cultures following ones desires (e.g., doing one's own thing, doing what one likes to do, etc.) is greatly emphasized.

The Indian worldview leads to building psychological models that are quite different from what we have in the West. The concept of self in indigenous Indian psychology includes *atman or soul*, which is posited as the real self in the Hindu worldview. Paranjpe (1998, 1986) argued that the self is the experiential center of cognition, volition, and affect in that it is simultaneously the knower (*atman*), the enjoyer or sufferer (*bhokta*), and the agent (*karta*). The self is surrounded by five forces, which destabilize it (Bhawuk, 1999). These forces are *ahankara, kama, moha, krodha*, and *lobha*. Ahamkara is a false ego, or the person's identification of the self with the body and mind. *Kama* is desire for worldly objects -- tangible (e.g., car, house, etc.) or intangible (e.g., prestige, love, etc.), which results from the self's interaction with maya, as discussed above. *Moha* is attachment to desired objects, and includes the sense of possession (e.g., this is mine). *Lobha* is greed or the desire to have more of the worldly things. *Krodha* is anger, which results when a person is not able to obtain what he or she desires. A person cannot attain peace so long these forces are in play and continue to destabilize him or her.

In the context of this worldview, Bhawuk (1999) derived a model from the Bhagavad-Gita, which describes how anger is generated. The process can be described as follows. Thinking about the objective and subjective worlds leads a person to develop attachment to these objects. Attachment leads to the development of desire for the object. Thus, an individual is directed toward goals through thoughts (cognition or perception), attachment, and desire. When desires or goals are not met, the person is unhappy, i.e., anger is generated. When desires or goals are attained, the individual wants more, i.e., greed is generated (See Figure 1). Thus, desires are kept at the center of both greed and anger, and to obtain harmony, one has to learn to deal with one's own desires.

Bhawuk (1999) also presented a solution that the *Bhagavad-Gita* offers for personal harmony and peace. According to this solution, a person who gives up all desires (*kama*) and leads a life without greed (*lobha*), attachment (*moha*), and egotism (*ahamkara*), is the one who attains peace. He argued that giving up these four leads to an absence of krodh or anger, the fifth destabilizer of self (see Figure 1), thus, leading the person to peace. Thus, the Indian thought system suggests that personal harmony can be attained through control of desires, greed, attachment, and egotism. The method of directing attention away from the outside world and to focus on the self, and within the self, is called *pratyahara*, and this is schematically captured in Figure 1 by the arrows pointing to the self.

The model raises many questions. A very important question pertains to development, progress, and capitalism. Capitalism depends on people's ever-growing desire for goods and services. Economic growth is stimulated by increased sales, i.e., by people buying more goods and services. Since desire is the source of personal disharmony, according to the above model, is capitalism destined to rob people of personal peace and harmony? Or, are those people and cultures that value personal peace, and think that it can be attained through controlling desires, destined not to make economic progress to the same degree as cultures that fan people's desires for material goods? Clearly, any attempt to answer these questions will be influenced by cultural worldviews.

Gergen (2001) and others (Gergen, Gulerce, Lock, & Mishra, 1996; Marsella 1998; Pawlik, 1991) have argued that it is difficult to understand indigenous psychological models if one does not understand the implicit assumptions made in a culture. The concept of self in the indigenous Indian worldview and its consequences for personal harmony was presented as an illustration of how an indigenous model is deeply rooted in its culture and derives from the cultural worldview. The inevitable conflict between the Indian worldview and the scientific culture is demonstrated in the next section by analyzing research on Transcendental Meditation.

Transcendental Meditation (TM) and Science

Research on Transcendental Meditation offers an interesting interaction between science and Indian worldview, and the consequences of such interactions. Maharishi Mahesh Yogi proposed TM as a method for achieving personal well-being and calming one's mind, which was later promoted as a tool for reducing stress (Mason, 1994). Serious academic research was started using people who practiced TM, and results were published in scientific journals

(Benson, 1969; Wallace, 1970; Wallace & Benson, 1972). The major findings were that oxygen consumption, heart rate, skin resistance and electroencephalograph measurements showed significant difference within and between subjects. During meditation, oxygen consumption and heart rate decreased, skin resistance increased, and electroencephalograph showed changes in certain frequencies.

Oxygen consumption decreased within five minutes of starting meditation. Compared to sleeping condition, TM provided 5% more reduction in consumption of oxygen than what 6-7 hours of sound sleep could provide. There was a mean decrease in cardiac output of about 25%, whereas during sleep there was only a mean decrease in cardiac output of about 20%. The mean decrease in heart rate for the TM practitioners was 5 beats per minute. The skin resistance (measured by Galvanic Skin Resistance or GSR), which is a measure of relaxation (the higher the score the more relaxed subjects are), increased on the average by 250% during the practice of TM, and went as high as 500%. Compared to this, during sleep GSR goes up by only 100 to 200 percent. Further, meditators were found to be less irritable than non-meditators (Wallace, 1970). Finally, in TM practitioners the regularity and amplitude of alpha waves were found to increase much more than what is found during sleep, the performance of TM meditators was superior to that of the Zen meditators in that they achieved the same result in a matter of weeks (Forem, 1973).

The credibility of TM "as a science" can be seen in its acceptance in American schools, and Jerry Jarvis, a disciple of the Maharishi, taught the first course on the "Science of Creative Intelligence" at Stanford University in February 1970 (Mason, 1994). A special note should be made of the use of the word science for TM. In the eighties, the Maharishi also presented experiments, in the tradition of empirical science, to demonstrate that meditation could help a practitioner levitate, and though this demonstration was very controversial, there were many doctors and scientists who thought that the demonstration did show the power of TM (Chopra, 1988). Recent work by the faculty of the Maharishi University and others shows that research on TM continues to follow the experimental scientific approach. It is likely that research on TM will cover a wide variety of concepts and ideas related to consciousness and neuroscience in future (Travis & Pearson, 2000; Travis & Wallace, 1999; MacLean et al., 1997).

This is the success story of TM in adapting to the scientific method. But the critics of TM offer an interesting insight into the conflict between scientific and Indian worldviews. Extending his studies beyond TM, Benson (1975) theorized that we have a "Relaxation Response" built into our nervous systems, much like the fight-or-flight reaction. Benson built his work on the work of Dr. Walter R. Hess, the Swiss Nobel prize-winning physiologist, who studied cats, and by stimulating a part of the hypothalamus in a cat's brain was able to arouse the symptoms of fight-or-flight response in the cat. Hess also demonstrated the opposite of this response by stimulating another part of the hypothalamus, and called it trophotropic response. Trophotropic response is a protective mechanism against overstress belonging to the trophotropic system and promoting restorative processes (Hess, 1957). The equivalent of the trophotropic response in humans is labeled as Relaxation Response by Dr. Benson (Benson, 1975). Benson concluded that relaxation response is elicited by practicing meditation, but they were in no way unique to *Transcendental Meditation* (Benson, 1975, p. 95, emphasis in original).

Benson (1975, 1984, 1996) suggested that there are four steps that are necessary to elicit the relaxation response. First the practitioner should find a quiet environment. Next, one should consciously relax the body muscles. Then one should focus on a "mental device," a word or prayer, for ten to twenty minutes. And finally, one should take a passive attitude toward intrusive thoughts. Thus, we see that what Benson proposes is basically TM with the exception that in the third step instead of using a mantra one uses what Benson calls a "mental device." Benson has given many secular focus words like "One," "Ocean," "Love," "Peace," "Calm," and "Relax, " but claims that "there is no 'Benson technique' for eliciting the relaxation response (Benson, 1996 p. 135)." What we see is an attempt to move away from TM, apparently to secularize the process and, therefore, make it more scientific. Here we see another value of science -- science is secular, and even if it learns from a religious or spiritual tradition of a culture, it attempts to create its own system by distancing itself from the traditional one.

We find an interesting conflict between traditional culture and science here. Benson in the zeal of following scientific methodology is willing to throw out traditional cultural knowledge as unscientific. A quote from a medical doctor, William Nolen, written in praise of Benson's (1975) book, the *Relaxation Response*, shows this bias against cultural knowledge.

> I am delighted that someone has finally taken the nonsense out of meditation....Dr. Benson gives you guidelines so that without the need to waste hundreds of dollars on so-called 'courses," the reader knows how to meditate - and how to adopt a technique that best suits him or herself. This is a book any rational person– whether a product of Eastern or Western culture– can wholeheartedly accept.

Dr. Nolen provides an example of how scientists or people who have bought into the scientific worldview need evidence of a certain type to believe in the findings. The mantra is

being referred to as the nonsense part of meditation, since the steps recommended by Benson are identical with TM, except for the use of the mantra. Since there has been no research showing the superiority of Benson's method over TM in reducing stress, it is plausible that Dr. Nolen has personal bias against TM. As scientists should we worry about the use of a mantra? Perhaps, science is impersonal, but not the scientists who do science. In a study of Apollo scientists, Mitroff (1974) showed that scientists have their personal biases, are intolerant of each other, and harbor hostility toward different types of scientists. We see this bias again on the web-page that describes Dr. Benson's new book, *Timeless Healing* (1996) (emphasis added):

> Harvard cardiologist Dr. Herbert Benson, whose new book, *Timeless Healing*, builds on *years of rigorous science*, was one of the first researchers to discover the power of spiritual tools to lower blood pressure and other stress symptoms.

The bias can be seen in calling Benson's findings as built on years of rigorous science, as if the Indian yogis invented the meditation technique without researching it rigorously in their own ways. Also, it implies that TM is less scientific, which is unfounded since all research done on TM has been done by using the obtrusive experimental approach that requires measuring various physical parameters. It is obvious that only those who have a training in science can understand or relate to such measures as "oxygen consumption," "decrease in cardiac output," "mean decrease in heart rate," "the skin resistance measured by Galvanic Skin Resistance," and "the amplitude of alpha waves." However, traditional knowledge has informed Indians for a long time that those who meditate are less irritable, which has also been reported in scientific studies (Wallace, 1970). Thus, one could argue that the scientific findings claimed by Benson and his supporters are merely translation of well known facts for the scientific community, or replication of findings known in the traditional culture for centuries.

Benson's (1984) model of anxiety cycle helps us understand his motivation for choosing the particular method of research. He posits that *anxiety* leads to *increased sympathetic nervous system activity*, which in turn leads to *worsening of stress, worry, pain, or other symptoms of an illness*. Benson theorized, which suits his scientific worldview, that Relaxation Response helps reduce both anxiety and increased sympathetic nervous system activity, thus helping the practitioner reduce stress and increase his or her wellbeing. The Indian yogis did not use meditation to reduce anxiety, but instead recommended it for withdrawing the mind inwards so that one could achieve self-realization (Bhawuk, 1999). Here we see how difference in motivation leads to different conceptual models and research agendas. Benson is a cardiologist, and is motivated to find ways to reduce heart illness, whereas the Indian yogis were interested in spirituality and so they invented many methods to pursue self-realization. When scientists use a method developed in traditional cultures, rather than using their findings to discredit traditional knowledge, we should use them to complement existing traditional wisdom, which may offer a win-win strategy for knowledge creation. It also allows us to consider indigenous approaches as scientific in their own rights, with their own method, logic, and way of verification, and prevents us from fitting them into the Procrustean bed of science.

To summarize, the objective of yoga is self-realization, to unite the self (*atman*) with the supersoul (*parmatma*), which only makes sense in the Indian worldview discussed earlier. Benson is a medical practitioner, and so he values physical health, and thus is happy to limit his findings to relaxation response, to solve the problem of stress. However, in the Indian cultural worldview, mantra or no mantra, meditation is not a tool for

physical health, it is a method to pursue self-realization, the union with Brahman (the concept of Brahman was briefly discussed in the section on the *Upanishads*). In the context of the Indian worldview, physical health resulting from meditation may be a byproduct, and nothing more. Thus, we see the conflict between values of science as a profession (or cultural worldview of the scientists) and the values of people in India (or the worldview of Indian culture). As cross-cultural researchers we have to deal with such conflicts.

Discussion

As cross-cultural researchers we are all scientists, and, therefore, buy into the value system of rational science (Rander & Winokur, 1970), which was discussed in the first section of the paper. But we are also a part of some culture, and so we share a worldview from that culture, often implicitly. Increasingly, the scientific worldview is being adopted in the western countries, but there is still a lot of resistance in other cultures to a total acceptance of the scientific worldview. It is not unusual for practicing scientists and engineers to use traditional knowledge, whether it is a voodoo technique to pacify a crying child or a text on astrology for finding an auspicious day to start the operation of a manufacturing plant. We find innumerable examples of how people are comfortable using the scientific methods in chemistry, engineering, and such other domains, but when it comes to areas where science is not able to give a definitive answer, they resort to other systems of explanations, which are often derived from their own cultures. And these are the domains of research for social science in general, and psychology and management in particular. We often find people using processes of decision making that could not be called rational. We can label such behaviors as superstition, and argue that such behaviors or their "unscientific" explanations would go away in time. Or, we can examine them more systematically, and learn about people's worldviews, what they do in different contexts, and why. Our worldview gives us faith in how the world around us works, and faith cannot be discarded.

Evidence from the medical science is increasingly pointing to faith as a tool in healing (McConnell, 1998). In one study at the Duke Medical School, the researcher found that among 455 elderly hospital patients those who attended church once a week stayed in hospital for four days on an average, whereas those who did not attend church spent 10 to 12 days in the hospital. In another study at Dartmouth Medical School, it was found that 21 patients who did not believe in God died within six months of surgery, but 37 people who were deeply religious lived longer. In Israeli kibbutzim, in a longitudinal study of 3,900 people, it was found that those who were religious had a lower heart-related death than those who were not. And in a Yale University study of 2, 812 elderly people, it was found that those who never go to church have twice the stroke rate compared to the weekly churchgoers (McConnell, 1998).

Faith and science are coming to an interesting confluence. Dr. Beson thought TM was a cult (Benson, 1974), and was driven to search for a secular "mental device" to get away from TM, which appeared religious and faith bound to him. Apparently he has come a full circle when he theorizes that "people are wired for God" and have an "organic craving" for the eternal (Benson, 1996, pp. 195-217 and 67-95). It comes as a surprise when in a disclosure of personal belief he states that his belief in God is based on scientific evidence.

> I am astonished that our bodies are nourished and healed by prayer and other exercises of belief. To me, this capability does not seem to be a fluke; our design does not seem haphazard. In the same way some physicists have found their

> scientific journeys inexorably leading to a conclusion of "deliberate supernatural design," my scientific studies have again and again returned to the potency of faith, so ingrained in the body that we cannot find a time in history when man and woman did not worship gods, pray, and entertain fervent beliefs. Whether God is conjured as an opiate for the masses, as Karl Marx suggested, or whether God created us to believe in an experience that is ever soothing to us, the veracity of the experience of God is undeniable to me. My reasoning and personal experience lead me to believe that there is a God. (Benson, 1996, p. 305).

Dr. Benson's statement above contrasts against that of Dr. Stenger (1999), a professor of physics.

> Claims that scientists have uncovered supernatural purpose to the universe have been widely reported recently in the media. The so-called anthropic coincidences, in which the constants of nature seem to be extraordinarily fine-tuned for the production of life, are taken as evidence. However, no such interpretation can be found in scientific literature. All we currently know from fundamental physics and cosmology remains consistent with a universe that evolved by purely natural processes (Stenger, 1999).

We see two scientists from different domains of research using "scientific evidence" to conclude the opposite, leaving us into much of a paradox. Can both Benson and Stenger be right? A rationalist research paradigm will never be able to resolve this, because only one solution can exist. Therefore, we need to go beyond the rationalist paradigm, and use not only multi-method within one paradigm, but use multiple paradigms -- particularly those suggested by indigenous worldviews. This should help us to study human behavior in its cultural context, and enable us to study issues that cannot be studied appropriately within the narrow confine of any one paradigm.

The multiparadigmatic approach calls for the nurturing of indigenous research agenda. However, the leadership of the western world in research and knowledge creation more than often leads to starting with theoretical positions that are grounded in western cultural mores. Thus, starting with a theoretical position invariably leads to the pseudo-etic approach in which theories are necessarily western emics. To avoid this Procrustean bed of western-theory-driven research it is necessary to start with insights offered by indigenous cultures and we present an approach to research that could help us avoid the pseudo-etic trap. It is proposed here that we start with insights from folk wisdom and classical texts in indigenous non-western cultures. We should enrich these insights with anecdotal evidence, qualitative analyses, and observational data from the target indigenous culture (Bhawuk, 2008a, 2008b, 2005, 2003, 1999). (See Figure 2).

This process is likely to result into emic-embedded or culturally rich knowledge, which could be used threefold by the three consumers of research (Brinnberg & McGrath, 1988), the theoreticians, practitioners, and empiricists. First, emic-embedded theory and models could be developed to study indigenous social issues by theoreticians and other researchers who are more theoretically inclined. Second, practitioners could use these models to solve practical problems in the culture where the idea originated. This would avoid the blind importing of solutions from the west, which often do not work because they are counter-cultural (Bhawuk, 2001). And finally, researchers who are more empirically inclined could use these models to guide indigenous and cross-cultural empirical research. Of course, theories could drive practice and empirical work, empirical work could lead to refinement of theories and models, and practitioners' experience could lead to empirical research or theory building when the accumulated experience warrants such efforts (See Figure 2).

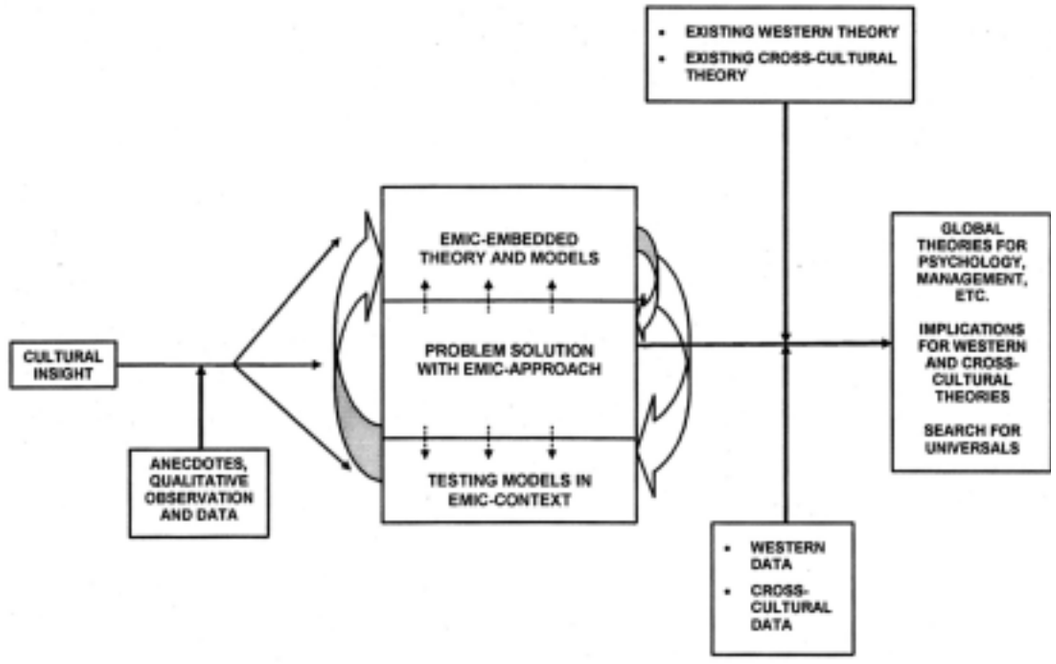

Figure 2 : The Role of Cultural Insight in Knowledge Creation

Models developed from such insights need to be informed or moderated by the existing western and cross-cultural theories and empirical evidence from western cultures as well as cross-cultural studies. This process, starting with cultural insight, examining existing theories, data, and other evidence, developing emic-embedded theories and models, and synthesizing such models with existing western and cross-cultural theories and data, should help us develop global theories for psychology, management, and other fields of human endeavor. Such an approach can expand the scope of research for western and cross-cultural theories, and in the long run will help us in the search of universals. This methodology is similar to following a strategy of using inductive approach in the beginning, and then following a deductive approach, which is often used in exploring new areas of research. However, the strength of the method lies in using inductive approach grounded in indigenous ideas even in domains where rigorous western theories already exist. Another clear strength of this method is that it avoids the pseudo-etic approach, which is often dependent on western theories, without completely discarding the western theories and empirical findings. Finally, this method allows us to use insights in theory building beyond mere speculation, and thus puts insight at the center of research endeavors and in knowledge creation. Figure 2 is a graphic representation of this method.

A wave of multidisciplinary research and writing further supports this research approach. Many Indologists have attempted to connect the *Vedas* and the Indian philosophy to modern science or scientific thinking. For example, Murthy (1997) attempts to show how the *Vedic* theory approximates the projections of earth science and even derives methods of predicting earthquakes from the *Vedas*. Similarly, many researchers in philosophy have attempted to highlight the

significance of the teachings of the *Upanishads* to modern scientific thought (Puligandla, 1997), and have attempted to show the compatibility of science, religion, and philosophy (Capra, 1975). Some Indologists have even attempted to show that mysticism is a corollary to scientific investigation (Prasad, 1995). Others have claimed that Hinduism laid the foundations of modern scientific search in cosmogony, astronomy, meteorology, and psychology (Iyengar, 1997). Vanucci (1994) examined the Vedic perspectives on ecology and its relevance to contemporary worldview. Thus, we see that there exists a growing trend to bridge science and traditional Indian knowledge. This is a trend that needs to be nurtured rather than discarded as an attempt on the part of scholars from traditional cultures to bolster their cultural knowledge by leaning on what we think is hard science.

The idea of using multiple paradigms extends Berry and Kim's (1993) proposals of ways in which indigenous psychologies will contribute to a truly universal psychology, or Sternberg and Grigorenko's (2001) proposal for a unified psychology, and is akin to Gergen's (2001) notion of postmodernist flowering of methodology. Cross-cultural researchers have been driven to search for universals in human behavior, and it is a continuing and primary purpose of cross-cultural research. Some cultural psychologists have contributed to our understanding of universals (e.g., Shweder, Mahapatra, & Miller, 1987; Slobin, 1990), and argue that it is a mistake to think that our common biological roots make the context bound study of differences in our values, attitudes, and behaviors superficial (Shweder, 1990). For example, the same arguably universal construct (e.g., "success") takes on very different meanings according to one's worldview. We cannot validly compare a successful person of 50 in India who begins his or her spiritual journey (*or Vanaprastha*) by giving up career and other worldly belongings, to an American facing a mid-life crisis, though on surface giving up a career may appear to reflect midlife crisis. Considering such issues will not mean abandoning the etic-emic approach, or the controlled laboratory experiments. But it does require more than multiple methods in a single (objective) paradigm: identifying universal and culturally variant aspects of behavior will require adopting indigenous paradigms to complement the objectivist paradigm, in an expansion of what is considered appropriate to science.

The multiparadigmatic approach will limit mistakes about universals. This approach combines Newtonian objectifying methods with subjective methods - including discourse analysis and ethnographic analysis - that allow comparing the variables under study in the context of their cultural worldviews. By learning about other worldviews, researchers will discover how their own worldviews have shaped their conceptions of potentially universal constructs and behaviors.

Smith et al. (2002) raised the issue how researchers of culture can benefit from the sort of complementarity of approaches proposed in the multiple-paradigms approach. Adequate training in any one of the scientific disciplines requires a significant portion of the human lifespan. Culture-comparativists and interpretivists therefore have little choice other than to confess their less-than-total understanding of the rigors of preparation and validation required by one another's paradigms (cf. Vaughan, 1999), and to form multiparadigmatic research teams. Such teams will contribute both to a triangulation of evidence for and against proposed universals, and to mutual re-education. Interdisciplinary surveyors like Pirsig (1991), Wilson (1998) and Zohar (1996) help supply a common working language for such teams. Journal editors in particular are in a position to encourage this sort of methodological pluralism by giving preference to manuscripts based on it (Smith et al., 2002).

To conclude, as scientists we have inherited much of the Newtonian worldview. Newton not only shaped the way we see the world, as animate versus inanimate; he also shaped our intellectual pursuit, our very method of inquiry: from subjective to objective, from looking from within to looking from without. This shift is clearly valuable for the physical sciences, but it is limiting to social sciences, especially cross-cultural research in psychology, sociology, and management. The limitations of objectivity; logical thinking of the type "If X, then Y;" and related elements of the Newtonian worldview were noted. It was argued that science itself has a culture, which is characterized by evolving tenets like objectivity, impersonalness, reductionism, and rejection of the indeterminate. By comparing Indian culture with the culture of science, some ideas were presented about how cross-cultural researchers might benefit from the worldviews, models, questions, and methods characteristic of indigenous cultures, especially those of non-Western origin. It was proposed here that there is a need for crossing disciplinary boundaries, and to use multiparadigmatic research strategies to understand various worldviews in their own contexts. We hope that multiparadigmatic teams can help us find linkages across disciplines and paradigms. Finally, a method of how to start research with indigenous ideas was presented, and it is suggested that developing programs of research following this method is likely to help us develop truly global theories in social sciences.

Marcella (1998) entreated researchers to replace the Western cultural traditions by more encompassing multicultural traditions, and reiterated the need to emphasize the cultural determinants of human behavior, which has been discussed in the literature (Gergen, 1994; Gergen, Gulerce, Lock, & Mishra, 1996; Pawlik, 1991). He recommended the systems orientation and noted that many indigenous psychologies are well equipped to deal with ascending dimensions of behavioral contexts, from individual to family to society to nature to spirituality. He further proposed that qualitative research including such methods as narrative accounts, discourse analysis, and ethnographic analysis should be encouraged. Following Maresella's recommendation, Bhawuk (2003) analyzed the role of culture on creativity using biographical sketches and historical analysis, and showed that we do not have to be limited to the standard control group design to study culture's influence on creativity. In three other papers, Bhawuk (2008a, 2005, 1999) derived various models pertaining to cognition and emotion, self and spirituality, and personal harmony from the Bhagavad-Gita, and showed how indigenous psychology can help global-community psychology by providing rich cultural models to understand human behavior. Thus, cross-cultural researchers need to take a lead in going beyond various methods into trying various paradigms to study human psychology in the cultural context. We need to be bold in speculating that perhaps X and not X do not always have to result in a zero, and may lead in some cases to infinity.

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ENLIGHTENED LEADERSHIP AND THE SPIRITUAL ANGLE OF MOTIVATION

Jyoti Verma*

This paper explicates the concept of enlightened leadership by tracing the earlier efforts which indicate that the conceptualization of enlightened leadership progressed through a developmental route. These studies drew attention towards the transactional incentives used by the leaders for influencing people that progressively gained qualitative refinement. In this frame, the objective of leadership became motivating the subordinates to grow into capable individuals in the process of realising organizational objectives. Having mentioned this it is argued that as against the 'deficiency driven' conceptualisation of motivation grounded in lower order needs, the incentives for the spiritual model of motivation are higher order or 'growth needs' such as need for self actualization and self purification. It is contended that in the conceptualisation of enlightened leadership, one witnesses a highly suitable frame which talks of being driven by higher order needs backed by a spiritual model of motivation and institutional power motive. Some important features of enlightened leadership are discussed.

The conceptualization of enlightened leadership has moved through a developmental route which may be traced back to the NT leader of Sinha (1980), towards the altruistic models of leadership referred by Kanungo and Mendonca (1996), to the now talked about self realization motivated, *Chitta Shuddhi* seeker enlightened leader (S.K. Chakroborty, 1987; 1993). The beauty of this conceptualization lies in the nature of transactions used by the leader for influencing people that progressively gained qualitative refinement before culminating into an inner source of motivation for the leader. Apparently, the objective of leadership became motivating the subordinates to grow into capable individuals in the process of realising organizational objectives. For example, Sinha's (1980) NT leader who seemed to be at a primary state of evolvement chose a transactional incentive like 'nurturance and care' for which the Indian subordinates had natural preference but reserved it only for those who cared to accomplish the task. The leader however, had a commitment namely, growth of the subordinates who would not remain 'dependence prone' for ever and must transform themselves into independent contributors for their organization as a result of the fatherly guidance, conditional affection and now engrained importance of task accomplishment under a NT leader.

In other words, the NT leader "cares for his/ her subordinates, shows affection, takes personal interest in their well-being and, above all is committed to their growth" (p.55). However, the leader's nurturance is contingent on the subordinate's task accomplishment. Basically, a NT leader believes that the subordinates should grow up and become mature enough to take responsibilities. Hence, once the subordinates reach a reasonable level of maturity, they generate pressure on the leader

* *Professor of Psychology, Patna University, Patna, India*