

World Hypotheses and the Evolution of Integrative Medicine: Combining Categorical Diagnoses and Cause-Effect Interventions with Whole Systems Research and Nonvisualizable (Seemingly “Impossible”) Healing

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1. Abstract

Schwartz and colleagues have proposed that to understand (1) the evolution of science and medicine, and (2) the integration of conventional, complementary and alternative medicine (CAM), it is essential to consider at least eight universal implicit meta-cognitive hypotheses. According to Pepper (1942), these implicit “world” hypotheses can be applied in every discipline of science. The present paper reviews the eight world hypothesis and proposes an additional hypothesis, termed the Nonvisualizable or “Nth” world hypothesis (adopting the mathematical concept of “N”; for example, as in N dimensional space). Drawing on contemporary mathematics and quantum physics, we propose that certain theories and data – by their inherent nature – cannot be visualized, and therefore may seem “impossible” (if not “unbelievable”) even though they are real. Certain seemingly anomalous observations in mind-body and energy medicine, including areas historically labelled as parapsychology or spiritual energy healing, often elicit strongly skeptical and dismissive reactions. We propose that these skeptical and dismissive reactions to purportedly impossible (yet logical) theories and seemingly unbelievable (yet replicable) data can be tempered when the Nonvisualizable (Nth) world hypothesis is understood and incorporated. Integrity in evidence-based science and medicine may require that scientists and non-scientists alike develop comfort and humility in accepting the human mind’s restricted ability to envision certain nonvisualizable – yet fundamental and real – concepts and effects, as illustrated in contemporary physics and CAM.

Key Words: CAM, integrative medicine, theories, implicit processes, healing

The consensus is that Joao [a renowned spiritual energy healer] is unbelievable – yet the cold empirical evidence of the success of his operations leaves them no choice other than to believe the unbelievable.

Robert Pellegrino-Estrich

These are the kind of data I wouldn't believe, even if they were true.

Anonymous comment made to Margaret Mead

What we find it difficult to understand or imagine, we consider it our right to deny.

Sri Aurobindo

The paradox is only a conflict between reality and your feeling of what reality ought to be.

Richard Feynman

2. Introduction

Schwartz and colleagues (1, 2) have developed a conceptual framework for integrating conventional Western medicine with complementary and alternative medicine from both the East and West. This framework, based on the work of philosopher Pepper (3), posits the development of increasingly more complex and abstract (as well as spiritual) hypotheses, or world hypotheses, about how nature works and evolves (4).

Buck, Baldwin and Schwartz (5) examined the relationship of Pepper's original four world hypotheses to chronic pain patient's health care choices. Buck et al found that patients who adopted categorical and mechanistic world hypotheses (1 and 2) tended to choose more conventional interventions, whereas patient's who preferred contextual and organismic/systemic world hypotheses (3 and 4) were more likely to select CAM interventions. Schwartz et al expanded the list of world hypotheses to eight (described below).

Building on Schwartz et al's earlier framework of eight world hypotheses, and drawing upon the established literature in contemporary mathematics and physics, we propose here a ninth world hypothesis, which we call the Nonvisualizable (or Nth) world hypothesis. As will become clear, we posit that the Nth world hypothesis is the most challenging and humbling (as well as "mystical") of all possible world hypotheses, and that understanding this implicit world hypothesis is essential to make conceptual sense of some of the most controversial observations and claims for CAM.

This paper presents 1) an overview to the Nonvisualizable world hypothesis, 2) a brief review of the original eight world hypotheses (1), 3) a discussion of the meta-world hypothesis that inspired the creation of world hypotheses in the first place (2), and 4) the

set of reasons for proposing adding the Nonvisualizable (Nth) hypothesis in order to comprehensively address theories that bridge the most challenging, controversial, and seemingly unbelievable concepts in mathematics, physics, psychology, medicine, and spirituality (Figure 1). Figure 1. Schwartz, et al.'s World Hypothesis Model Revised to Include the Nth World Hypothesis (labeled, Mystery).

3. Overview to the Nonvisualizable (or Nth) World Hypothesis

The Nth world hypothesis proposes that to understand certain phenomena in nature, it is essential to try to “imagine” phenomena that are inherently and ultimately “non-imaginable.” Consequently, because certain concepts and data are inherently “nonvisualizable”, they may seem to be “impossible” and “unbelievable,” and be dismissed, even though they are in fact true.

The necessity for positing and accepting certain nonvisualizable concepts and findings in science and medicine is illustrated by abstract theories in contemporary mathematics and physics. For example, the “imaginary” number i -- the square root of minus one – which is actually non-visualizable, or the existence of 10 or 11 dimensions in super string theory – which are also nonvisualizable, can be “real” even though they can not be visualized, except in metaphorical (and therefore incomplete) ways.

The most anomalous theories and findings in contemporary psychology, medicine, and spirituality, as reviewed by Cardena, Lynn, and Krippner in *Varieties of Anomalous Experience* (6), require that an implicit world hypothesis (termed the Nth world hypothesis) be entertained and ultimately accepted. To avoid possible misconceptions at the outset, the reader should appreciate that we are not proposing that all things that are unbelievable must be therefore true. That would be both nonsensical and nonscientific. Instead, what we are proposing is that just because something seems impossible and unbelievable does not necessarily make it unreal. We are proposing that both logic and data lead to the conclusion that certain things that seem quite unimaginable – and even seem impossible and unbelievable – may reflect some of the deepest and most foundational qualities of nature and reality.

4. World Hypotheses

World hypotheses are meta-cognitive structures that reflect implicit assumptions about how the world works and evolves. According to Schwartz, et al.: ... world hypotheses reflect implicit, content-independent assumptions about how nature works, assumptions that shape all aspects of information processing—thinking and feeling, problem solving and creativity, planning and intuition. New hypotheses emerge under the pressure of new experiences and understandings (2) (p. 6).

Table 1 shows the eight world hypotheses, the original four proposed by Pepper (3) and the additional four proposed by Schwartz, Russek, and their colleagues.

Table 1 Eight World Hypotheses

World Hypotheses		Description
World Hypotheses of Pepper		
W1	Formistic	All structures and functions exist as separate categories
W2	Mechanistic	All effects have causes that precede them
W3	Contextual	All structures and functions exist in context and are relative
W4	Organismic	All structures and functions reflect organizations of interactive relationships—parts interact and become whole systems
World Hypotheses of Schwartz, Russek, et al		
W5	Implicit Process	All systems involve invisible processes of information/energy/matter that interact over time
W6	Circular Causality	All systems involve the circulation of information/energy/matter that interact and change dynamically over time
W7	Creative Unfolding	All systems reflect flexible orders, express plans, and serve multiple purposes
W8	Integrative Diversity	All phenomena in nature reflect complex interconnected, integrated orders or harmonies of diverse processes

4.1. World Hypothesis 1 — “Formistic”

The first of Pepper’s world hypotheses establishes categories of experience or content. The simplest of these is the binary “black” and “white,” or “right” or “wrong” view of the world (1). Classification sciences such as botany, zoology, personality, and pathology, reflect the formistic world hypothesis.

4.2. World Hypothesis 2 — “Mechanistic”

The mechanistic world hypothesis, the basis of classical Newtonian science, assumes that there is a cause and effect for all events in nature (1). As Wilber (7) describes it, “if you do this, that will follow.” Single cause-single effect models were the basis of classical reductionistic science, from physics (e.g. Newtonian) and biology (e.g. the germ theory of disease) through psychology (e.g. stimulus-response) and ecology (e.g. global warming caused solely by the burning of fossil fuels).

4.3. World Hypothesis 3 — “Contextual”

The contextual world hypothesis adds relativism and says, “It depends upon the way you look at it”. It says that everything exists in a context and that there are always at least two ways of understanding phenomena, based on the context and the point of view of the observer. This formed the basis of Einstein’s relativity theory and Heisenberg’s

uncertainty principle, and expresses itself in seeing alternative interpretations for phenomena (e.g. disease can be caused by the presence of a pathogen or the resistance of the host's immune system – depending upon the way you look at it.)

4.4. World Hypothesis 4 — “Organismic”

The organismic world hypothesis says that everything is related to everything else. This is basic systems theory where each thing is both a whole and a part, termed a “holon.” This model is also dynamic in that each thing is dependent upon other things in the system. Everything is interconnected to various degrees. This worldview serves as the basis of modern biology and engineering, as well as systemic approaches to health psychology, psychosomatic medicine and behavioral medicine (e.g. disease can best be described as being caused by complex combinations or interactions of processes such as the presence of pathogens interacting with the status of the immune system).

Note that from an organismic/systemic perspective, each world hypothesis incorporates and extends the previous hypothesis:

- Cause-effect thinking (the 2nd world hypothesis) implicitly requires categorical thinking (the 1st world hypothesis)
- Contextual thinking (the 3rd world hypothesis) involves multiple categorical and cause-effect thinking (the 1st and 2nd world hypotheses), and
- Systemic thinking (the 4th world hypothesis) involves a complex combination of categorical, cause-effect and contextual thinking (the 1st, 2nd, and 3rd world hypotheses).

Also note: each hypothesis reflects an evolution in complex information processing – expressed in the evolution of mathematics and science to the evolution of consciousness itself.

4.5. World Hypothesis 5 — “Implicit Process”

Schwartz and Russek (1) drew from contemporary theories in science (as well as long standing beliefs in Eastern as well as ancient cultures) to formulate their four additional world hypotheses. The first of Schwartz and Russek's hypotheses posits that there are invisible processes that can be understood by science, energy being a good example (1). Schwartz and Russek say, “...a major goal of science is to envision the invisible, discover the invisible, and come to understand the invisible” (1) (p.13). The sciences of physics and psychology, for example, are both founded on the principle of implicit process thinking: making the implicit explicit by inferring the underlying processes of natural systems from their observable behavior. Neither gravity nor cognitions can be seen. Only their resulting behaviors are observable and measurable. The 5th world hypothesis includes mind-body medicine, energy medicine, and spiritual medicine.

Note that implicit-process hypothesis means “invisible,” not “nonvisualizable.” As will become clear below, some concepts in mathematics and physics are not only implicit (as

in invisible yet imaginable), but they are literally non-visualizable (i.e. impossible to visualize and therefore are “nonimaginable”).

4.6. World Hypothesis 6 — “Circular Causality”

This hypothesis posits that there is a constant circulation of information, energy, and matter in all natural systems (1). Schwartz and Russek elaborated on this concept in their book, *The Living Energy Universe* (4), in which they account for memory and learning in systems through mutually reinforcing (or learning) feedback loops. In the simplest two component system, component A sends information to component B which interprets the information, sending it back to A, which in turn reinterprets the information, sending it back to B, and so on.

This hypothesis extends contemporary science to consider anomalous phenomena, from memory in water (homeopathy) and cellular memory in heart transplant patients, to memory in complex biochemicals (e.g. DNA). It includes contemporary developments in nonlinear dynamics, complexity theory, and chaos theory (4).

4.7. World Hypothesis 7 — “Creative Unfolding”

This world hypothesis suggests, “...order, especially complex order, does not arise through chance, but emerges from explicit, or implicit intentions or plans” (1) (p.15). Schwartz and Russek (1) call these programs, the “generic” code (after the term “genetic code”) and follow the notion of “implicate order” as postulated by Albert Einstein’s distinguished student, David Bohm. Bohm said, In terms of the implicate order one may say that everything is enfolded into everything. This contrasts with the explicit order now dominant in physics in which things are unfolded in the sense that each thing lies only in its own particular region of space (and time) and outside the regions belonging to other things (8) (p.177).

Schwartz and Russek further say, “Trial and error, intention and accident, this is the vision of the creative unfolding hypothesis. From this perspective, things in nature do not occur “by chance,” rather they are “given the chance” to occur” (1).

Schwartz and Russek acknowledge at this point that they are entering into the spiritual or mystical realms. “Issues of growth, change, meaning, spirit, soul and love logically follow from the creative unfolding hypothesis...” (1997:17). This world hypothesis addresses a subset of anomalous theories and phenomena purported to occur in spiritual energy healing (e.g. that a great-spirit, source, or God can play a role in healing).

4.8. World Hypothesis 8 — “Integrative Diversity”

Schwartz and Russek’s final world hypothesis, although they proposed that others might be discovered in the future, is their most “inferential, complex, and spiritual” (1) (p.17). This is a hypothesis of complete integration where seemingly contradictory phenomena can exist in the same “soup” as Schwartz and Russek call it (1) (p. 19). An example of

such a theory in physics is complementary – how light can be both a wave and a particle. It is the search for the grand unifying theories of nature that allow for all possibilities in what may be known to humans only as a mysterious plan. It reflects physics dream to create TOE's (theories of everything), what Wilber calls integral theories (e.g. Wilber [9]). The search for Integrative-Diversity theories arguably reflects the greatest conceptual (and political) challenge for contemporary science, including integrative psychology and integrative medicine.

5. “Loving Openness” as a Meta-World Hypothesis

After they developed their eight world hypotheses, Schwartz et al (2) discovered that underlying their effort to posit implicit world hypotheses was a deeper implicit question, “Why formulate the world hypotheses in the first place?” Their conclusion was that additional implicit world hypotheses were needed to facilitate discovery in nature, not merely describe it. To account for this facilitation, they further expanded their model by adding a “mother of all meta-hypotheses” – a “meta-meta hypothesis” (since world hypotheses are themselves meta-hypotheses), termed “Loving Openness.”

Loving openness has a two-fold purpose according to Schwartz et al: “1) to foster creativity (including freedom and flexibility); and 2) to foster caring (including honesty, sharing, and generosity).” Combining “openness” and “loving” captures the “relentless search for truth” (2) (p. 8). Schwartz et al.'s (2) model is shown in Figure 1 (the Nth, world hypothesis entitled “mystery,” has been added to this diagram).



Figure 1: World hypothesis model revised to include the Nth world hypothesis, Mystery

The positing of a 9th world hypothesis requires the adoption of the loving openness meta-world hypothesis and the first eight world hypotheses. As Warren McCulloch, the distinguished neurophysiologist said it: “Do not bite my finger; look where I am pointing.” (10)

6. The Nth World Hypothesis: Positing and Accepting Nonvisualizable Phenomena and Mechanisms

The Nth world hypothesis proposes that to understand *certain phenomena in nature*, it is essential to try to “*imagine*” phenomena that are inherently and ultimately “*non-imaginable*.” Consequently, because certain concepts and data are inherently “*nonvisualizable*”, they may seem to be “*impossible*” and “*unbelievable*,” and be dismissed, even though they are in fact true.

The inspiration for recognizing the need to posit a ninth world hypothesis occurred while Schwartz was reading Nadeau and Kafatos's book, titled *The Non-Local Universe: The New Physics and Matters of the Mind*. In the process of reviewing theories and data supporting the concept of non-local phenomena in contemporary post-modern physics, the authors proposed the profound distinction between:

(1) those concepts and processes that are abstract but can be imagined (in the sense of being capable of being visualized, e.g. most 5th world hypothesis concepts), and
(2) those concepts and processes which were inherently unimaginable (in the sense of being impossible to visualize) and could only be described approximately through metaphor.

The title of chapter 2 of Nadeau and Kafatos's book, *Leaving the Realm of the Visualizable: Waves, Quanta, and the Rise of Quantum Theory*, (11) initiated this fundamental appreciation in Schwartz, and he discussed this controversial implicit world hypothesis at some length with Schloss.

We came to appreciate that certain well accepted abstract mathematical concepts (such as the "number 1", "n dimensional space," "infinities of infinities," to list a few) as well as certain contemporary concepts in quantum physics (including Heisenberg's uncertainty principle and Bell's non-locality theory) were inherently and unavoidably nonvisualizable. Such concepts could be labeled with words, and even sometimes be described metaphorically. However, the actual concepts themselves were beyond complete verbal or visual description. Their understanding was both abstract and intuitive.

This is why certain theories and findings in quantum physics seem so "weird." Physicists playfully label this observation "quantum weirdness."

We came to recognize that the well - known phrase "these are the kind of data I wouldn't believe, even if they were true" (spoken often about empirical findings in parapsychology including research on telepathy, remote viewing, mind-machine interactions, and mediumship – e.g., Radin (12), Schwartz and Russek (4), Cardena et al (6), Schwartz (13) - speaks to the common feelings of "impossibility" and "unbelievability" about certain concepts and observations in nature and the universe as a whole.

In discussing the need for a ninth world hypothesis with Schloss, the latter pointed out that this was the heart of spiritual experiences typically described as mystical. Mystics throughout recorded history have described this in terms of the "mystery"

Schloss proposed that calling the proposed nonvisualizable (yet real) world hypothesis the "ninth" world hypothesis was insufficient to express its ultimate meaning for the world hypothesis framework as a whole (since other more specific world hypotheses might be discovered in the future).

Following a detailed discussion of the nonvisualizability of n dimensional space (i.e. beyond four dimensions of three-dimensional space plus time), and in keeping with the generic mathematical concept of “n,” Schloss proposed the label, the Nth world hypothesis.

Note that positing the Nth world hypothesis immediately speaks to the experience of most scientists (regardless of their degree of openness to anomalous phenomena in psychology and medicine) that certain contemporary theories and findings are “impossible” and “unbelievable.” For example, despite the findings of double-blind distant intentionality studies documenting that prayer can be associated with measurable and significant healing (e.g. Dossey 14), the conclusion that “double-blind prayer can heal” still seems “impossible.”

In current laboratory research with research mediums (e.g. Schwartz (2), Schwartz et al (15), Schwartz (13)), we have repeatedly witnessed phenomena (replicated and captured on video tape) that seem “impossible” and “unbelievable” yet clearly have happened. Some of the observations go beyond anything posited by the eight world hypotheses (note, predictions from hypotheses 5-8 often seem “unbelievable” to individuals who only adopt hypotheses 1-4).

Often when data seem unbelievable, we search for explanations to explain (or explain away) the findings – including statistical accident (i.e. the findings are due to chance), possible experimenter error or bias, and even potential experimenter fraud. However, some observations turn out not due to these common “causes” (the 2nd world hypothesis), or even a combination of them (hypotheses 1-4, or more).

Here is how Sri Aurobindo (cited in Dalal [16]), the great Indian scholar and mystic described how people respond to claims of mind not only influencing matter (as documented in 20 years of research in Princeton University’s PEAR (Princeton Engineering Anomalies Research) Laboratory in the Department of Electrical Engineering, (17), but mind existing in matter itself.

The consciousness of Matter, of the inert form, is difficult indeed for us to understand or imagine, and *what we find it difficult to understand or imagine we consider it our right to deny.* (italics added).

The temptation to dismiss data we find impossible to believe can be tempered once we recognize, and accept, that contemporary mathematics and physics require that we go beyond what we can visualize and imagine in four dimensional spacetime. We propose that these mathematicians and physicists are implicitly adopting an implicit meta-cognitive hypothesis into realms that can not be visualized.

In his recent book *Mysterious Flame: Conscious Minds in a Material World*, McGinn (18) terms this “Mysterianism.” Schloss simply terms it “the mystery.” The principle is the same – being open to McGinn’s statement of the possibility that “our intelligence is

wrongly designed for understanding consciousness.” (p. xi) (and we would add, many other things).

If mind-body medicine in particular, and psychology and medicine more broadly, wish to consider themselves to be “logic-based” sciences as well as “evidence-based” sciences, it seems necessary that researchers and clinicians seriously consider adopting some version of an Nth world hypothesis.

We propose that it may be time for science and medicine to expand its implicit world hypotheses, and that we come to recognize that certain concepts and observations in the physical, chemical, biological, behavioral, social, and ecological sciences, require that we open our minds beyond our ability to visualize. Furthermore, it may be time for us to accept, with humility, that a subset of theories and findings may always remain beyond what can be imagined by the human mind which is constrained in space and time. (Of course, in principle one should remain open to the possibility that what is nonvisualizable today may become visualizable in the future.)

There was a time, not so long ago, that our everyday experience of a flat earth and a geocentric universe led many scientists and non-scientists alike to refuse to journey out to sea or look through the telescope. Refusal to look at data continues to this day. For example, some of Schwartz’s most skeptical colleagues exercise their right to refuse to look at raw video tapes of research mediums in controlled laboratory conditions engaged in replicable anomalous information retrieval.

As Sir William Crookes put it, “I didn’t say it was possible, I said it happened.” Extending Crookes’ remarks, we say “If it happens, it is possible.”

As the history of science reminds us, in order to conduct empirical research (as well as perform clinical practice) with integrity, it is prudent that we resist the temptation to exercise our “right to deny” theories and observations (especially replicable observations) that we can not understand or imagine. The purpose of considering and implementing world hypotheses, especially the Nth world hypothesis, is to assist the process of evolving a comprehensive integrative medicine, and caring integral vision of health and health care.

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