

Towards Consilience Between Research Paradigms and Spiritual Practice

Thomas D. Meacham, MD

Abstract:

Spirituality is widely recognized as a function of health, of wholeness, and in some fashion central to psychological healing. In recent decades western medicine has found renewed interest in the spiritual aspects of healing with the development of psychedelic-assisted psychotherapy, a form of treatment commonly observed to induce spiritual and mystical experiences. Questions about the role of the mystical experience in psychological healing have led to the desire to research the subject. However, this state is well known to be difficult to study objectively due to its ineffable quality, problems with defining terms, and apparent theoretical and philosophical differences from research paradigms. This paper attempts to find the most fundamental common theoretical ground possible in order to attain consilience between research as it is performed and the spiritual experience towards the goal of improved theory and better treatment designs and clinical outcomes. This is done by conceptualizing the spiritual experience as a homeostatic mechanism to optimize the various codes of life. This places the spiritual experience in the same framework as other aspects of the social and biological sciences. As a special case, the mystical experience is conceptualized as associated with directly accessing codes created through early childhood social learning. Boundary cases and counterintuitive implications of this paradigm are discussed.

Keywords: Research, spirituality, mystical state, psychedelic-assisted psychotherapy

INTRODUCTION

Edward O. Wilson, evoking William Whewell, observed, "The greatest enterprise of the mind has always been and will always be, the attempted linkage of the sciences and humanities. The ongoing fragmentation of knowledge and resulting chaos in philosophy are not reflections of the real world but artifacts of scholarship.... Consilience is the key to unification.... Literally a 'jumping together' of knowledge by the linking of facts and fact-based theory across disciplines to create a common groundwork of explanation. A consilience of inductions takes place when an induction, obtained from one class of facts, coincides with an induction obtained from a different class. This consilience is a test of truth of the theory in which it occurs ^[1]."

Research into psychedelic-assisted psychotherapy seeks to explore the treatment

of disorders, during which spiritual and mystical subjective experiences are commonly observed to understand the mechanism of change and improve outcomes using these methods. Medical research is commonly understood to involve the scientific method, which collects objective data under controlled conditions. As will be explored in this paper, subjects engaging in psychedelic-assisted psychotherapy commonly report spiritual or mystical experiences, states that are known for their ineffability. Thus, some issues with obtaining reliable, objective data are observed, at least beyond that obtained through psychometric inventories of subjective states. While inroads into the question of this relationship, of the spiritual experience to healing in the context of entheogen use, are being made, much remains to be determined. It would seem that somehow the scientific method tends to be a very ill-suited tool to

explore much of what is described as the spiritual experience and related concepts, given also very different theoretical and philosophical soils that they are rooted in.

If one could find common ground in their underlying philosophies, it would help determine a language of use common to spiritual matters and the scientific method of determining knowledge. Ideally, this common ground would stunt neither side in some conceptual procrustean bed and could potentially allow for the spiritual experience to be analyzed more deeply and by a wider array of scientific tools than is currently achieved.

DEFINITIONS

If a social psychologist, a Catholic priest, and a Zen monk were to walk into a bar and order a *Spiritual Experience* from the bartender, a quarrel might break out among them over just what the drink consists of. Given that the vocabulary pertaining to the spiritual experience is in widespread usage, definitions and concepts, as explained, should be readily obtained from the most easily available of references, so basic internet resources will be used for examples of definitions and explanations as retrieved at the time this paper was composed [2] and abridged for clarity.

The Merriam-Webster Dictionary Online defines *spiritual* as (abridged):

1. of, relating to, consisting of, or affecting the spirit: INCORPOREAL
2. of or relating to sacred matters
3. concerned with religious values
4. related or joined in spirit
5. of or relating to supernatural beings or phenomena

None of the definitions above could be used to measure anything objectively for research, except in the phenomenological sense of whether the subject says it is spiritual or not and perhaps some expressed degree of relative magnitude.

In attempting to describe *spirituality*, William A. Richards in *Sacred Knowledge* does not aim for a specific rigid definition, but notes, "Love, nobility, the creative yearnings to strive towards excellence and what we humans call "greatness" are manifestations of that part of the mystery of our being that we call 'spiritual.' The same is true of dedication and courage to care about human foibles and the commitment we make towards the resolution of personal, societal and international impasses [3]." It may be difficult to map that explanation to the dictionary definitions in a concise way. Among the definitions, perhaps "related or joined in spirit" would fit most closely. Elsewhere he notes some people would define *spirituality* as separate from *religiosity*. However, he disagreed with that in light of the definition of *religion* implied by its Latin root *religare*, "to ...signify what most profoundly binds us together and reflects a shared perspective on what gives life its deepest purpose and meaning," which he found to be deeply spiritual [3]. This does highlight that all do not entirely agree on the definition of the word. Jastrzębski explored the difficulty of attempting to make precise definitions, pointing out at least 40 definitions of spirituality [4].

An apparently less spongy concept is that of the *mystical experience*. The dictionary definition of *mystical* [5], however, is still not much of a help:

- 1a: having a spiritual meaning or reality that is neither apparent to the senses nor obvious to the intelligence
- 1b: involving or having the nature of an individual's direct subjective communion with God or ultimate reality
- 2: MYSTERIOUS, UNINTELLIGIBLE

Furthermore, as a term of art, it has been perhaps better described. William James described the elements of the mystical experience to include, Ineffability, a noetic quality or "insight into depths of truth unplumbed by

the discursive intellect," Transiency of the experience and the passivity of the Individual having the mystical experience [6]. Similarly, Robert K.C. Foreman described the *pure consciousness event*, which includes the core characteristics of *unity*, the *transcendence of time and space*, *intuitive knowledge*, *sacredness*, *deeply felt positive mood*, and *ineffability* [3].

On the other hand, research is dependent on careful definitions with high inter-rater reliability and reproducible results to help obtain better fundamental insights. Most scientific research is reductionistic and seemingly fundamentally at odds with the study of spiritual or mystical experience. Nevertheless, somehow, there remain unanswered questions about psychedelic-assisted psychotherapy, not least of which include delineating the role of the mystical experience in the mechanism of healing with this technique, as well as determining what spiritual practices on the part of the therapist may improve their effectiveness in delivering a healing experience. Because of this, there is potential value in attempting to bridge the paradox between the drug-facilitated mystical experience and the use of research to learn more about it.

The boundary conditions regarding spirituality would be important for an understanding of the concept. One question arises, analogous to the debate as to whether dogs have souls, namely, exactly who or what it is that can experience spirituality. This, of course, starts with defining what spirituality is, and an answer would be derived from the specific definition. Concreteness and specificity in the definition might be desirable. It seems intuitively obvious that humans are capable of spiritual life, and to some people, the question of whether a dog can be spiritual is an obvious yes, while others might stridently disagree. Is spirituality strictly the domain of human beings? What about AI? Like so many other cognitive and emotional properties once thought to be the sole domain of

humans, they have been observed in other species. Now, while no computer system has been able to fool all people in all circumstances to think that the system is, in fact, human, simpler versions of the Turing Test are passed by AI regularly, as evidenced by the yearly winners of the Loebner Prize [7], something like a spirit is being observed in systems not considered alive. Many science fiction stories have attempted to explore exactly that issue [8].

It is also clear that from the multitude of paths to choose from, a given path is not some universal truth *per se*. How does one hope to determine the validity of a spiritual path? Perhaps they are all equally valid, although it is not obvious why that would be, any more than allowing that they are *not* equally valid without some objective criteria to judge them.

Another question regarding the nature of spirituality is one of magnitude. Can a person have zero spirituality, and how would one know if that were the case? In that people undertake one *spiritual path* or another would suggest that Spirituality has a magnitude or degree that can change over time and person to person. Engaging in research means measurement. How is a researcher supposed to measure these things? The ideal would be to attach an electronic instrument to a test subject and measure how much spirituality they are radiating in some objective units that could be called perhaps *numins*. Such a measurement would be ideal for use in research, and by that standard, it would be a very desirable goal to achieve. People often judge others subjectively by the magnitude of their spirituality, so it would seem that humans do it informally, but at this time, finding a truly objective measure of the magnitude of spirituality is a lofty goal. An example of why it is so vexing is, again, people do not share a common definition of what constitutes spirituality; what is intensely sacred to one person is profanity to another. A worthy path to one

individual may well be irrelevant to another and carries no spiritual magnitude to them. If a common element to define spirituality were found for all cases, there could be hope for the desired consilience between research and spirituality.

One more pertinent concept that we all seem to know when we see it, but the definition of which is maddeningly hard to pin down is *life*. Central to all of this would seem to be the meaning of life, but how can that be determined when the current Wikipedia article on *Life* notes, "There is currently no consensus regarding the definition of life." It does, however, attempt the feat, as will this paper, at least in a narrow fashion, to find a common language to undertake research on spirituality, mystical experiences, and psychological healing.

Trifonov compiled 123 different definitions for *life*, consisting of "nine groups of defining terms (definientia) of which the groups (self-)reproduction and evolution (variation) appear as the minimal set for a concise and inclusive definition: Life is self-reproduction with variations ^[9]."

The definition to be suggested in this paper does suggest both evolution and self-reproduction, but only as implied, not overtly stated. It also may be substantially similar to definitions that invoke thermodynamics. However, approaches involving physics are also merely implied. It is designed to align itself with concepts found in biology and religious or spiritual concepts and recent concepts found in the study of self-organized complex systems, such as *cellular automata* and *artificial life*.

This paper's thesis requires the inclusion of two elements to be used to define spirituality that may be common to all life, even if not clearly proven to be necessary or sufficient for an actual definition of life—the existence of some instruction set and the machinery to carry it out. If viruses count as living things, the machinery can even be

borrowed or stolen. Further, the machinery in living things is most typically coded by the instruction set. Both of these conditions leave the identity for something living in the instruction set, the *logos*, but in this scheme, it is not alive until the machinery exists to carry out the instructions is available in some form or another. In this schema, life exists as a computation, functioning dynamically to optimize itself within its complex and ever-changing environment. This paper will develop a working definition for spirituality that also uses this concept.

The instruction set for a living thing does not have to all be in one place or time, and if that is the case, it would also necessarily be true of the machinery, given a part of the machinery would encode the instruction set and the instruction set would typically encode instructions to create the machinery. It also implies that different individual organisms may share both information and machinery, as can plainly be seen in the cases involving different hierarchical levels of life, including sexual reproduction or in colonies of cooperating people manifesting an organism called society. These nonbounded uses of instruction sets and machinery would imply that a paper and ink book is a part of life even if not alive itself, as it is an instruction set, but no mechanism is seen to exist in the book itself.

There may be more subtle implications of this definition of life. It is one of the definitions that does not require that the living thing is biological. Since John von Neumann first designed modern computer architecture, an operational computer has included an instruction set and the machinery to carry it out ^[10]. While a computer running a program may not itself evolve, it may, for instance, facilitate a cellular automata program, the iconic one being Conway's *Game of Life*. Existing only in a computer simulation and based entirely on the initial conditions, individual configurations may change, die out, evolve more or less complexity or even reproduce ^[11].

Richard Dawkins imagines alien life that we would not recognize as such, including biochemistry is based on silicon rather than carbon, or ammonia rather than water, or even life based on "electronic reverberating circuits ^[12]." There may be life whose instruction sets appear so widely distributed over time and space (physical or semantic space) that they are not even recognized by humans as, in any way, associated with each other ^[13].

A cybernetic concept of spirituality: optimizing both the instruction sets and the machinery to carry the instruction sets out.

Another implication is that life may exist in ways not before considered. Mathematician Stephen Wolfram declared, "It is possible to view every process in nature or elsewhere as a computation ^[14]. Whereas Animism, the concept that all things contain souls, has been held to be a shamanistic or ancient religious view, the similar idea that all things, to at least the level of simple systems, contain a mind, has gained popularity in some potentially rigorous philosophical and scientific circles, most notably in recent years through *The Integrated Information Theory of Consciousness* ^[15,16].

Such a definition starts to place mystical and scientific concepts in closer alignment than might otherwise be expected. Genetics and physiology correspond to an instruction set and the machinery to carry it out, respectively ubiquitous in the world of biological systems. In the domain of spirituality, when looking for instruction sets and the machinery to carry them out, it may help take the broader view of the language and the metaphors commonly employed by people engaged in spiritual practices. Terms like *The Word, logos, scripture, gnosis, received wisdom*, and references to being on a particular spiritual path all suggest that a given spiritual discipline carries information, an internal logic that often implies some form of boundary to determine inside from outside the system. Formal religions may be seen as one

type of vehicle to carry the information and contains people who carry out the system's instructions. Presumably, by carrying out the instructions, humans may be furthering the propagation of the genes they themselves carry, and the genes may reciprocally code for the tendency to seek out spiritual paths.

As an example of this interplay, consider the instruction set known as The Ten Commandments. It is contained in part of a very successful family of spiritual paths. It encodes a set of instructions that propagate the religion (admonitions to place no god before Jehovah, proscriptions against graven images, to keep the sabbath, detailing forbidden utterances in the name of the religion), guidelines to order the larger community, and even to maintain the genetics of the group as with the prohibition on killing which historically was not used to proscribe killing as an act of war or the killing of animals ^[17]. So, this very succinct instruction set, held firmly within a specific family of religious, spiritual paths, has sociological and even genetic/evolutionary implications for our species. Interestingly, these concrete implications of the Ten Commandments for maintaining a functioning culture and even survival as a species are as true whether the god of Moses actually authored them or whether or not that deity exists.

Pargament *et al.* note, "Virtually every major religious tradition speaks of life as a journey and provides its adherents with a map for the pathways they should take in life. We hear of the Eightfold Path in Buddhism. The Pillars of Islam describe the central pathway of living as submission to the will of Allah. Within Taoism, the word Tao literally means "the Way." However, it is important to note that although some people may follow the "preconstructed" pathways that have been made available to them through their traditions, others prefer to construct their own paths. Religious and spiritual pathways are constructed out of the raw materials of

cognition, affect, behavior, relationship, and biology ^[18].”

A person in the community finding their spiritual fulfillment lacking will often try to find some new or different spiritual path or try to find renewal in their longstanding spiritual tradition. Typically, they may set out to discover that path in some fashion, for instance, to go back to church, branch out to explore a very different religion, or perhaps take a sacramental entheogen with or without the aid of a guide. What exactly sets somebody off on a new spiritual path? Presumably, something about life as it is being lived is missing that should be present, or something present that ought not to be, or there be an unbalance somewhere when spiritual life is felt to be unfulfilling. This is another poorly defined situation that is encountered frequently, as evidenced by the sheer number of spiritual guides preaching their message to seekers with the desire to convert them into becoming a member of a group of devoted followers.

Sometimes, sudden spiritual changes happen abruptly, not just at the personal level but also so widespread as to represent a major change in an entire culture's spirituality or religion. One region of New York State became known as the Burned-Over District based on many new spiritual movements to emerge from there during the Second Great Awakening of the early nineteenth century. The name alluded to the region being metaphorically on fire with movements to include new religions in the Judeo-Christian tradition, such as the Shakers and the Mormons, and the wider diversity of the types of different practices, with the common theme being that they are considered spiritual. The region was the source of Spiritualism and the Oneida Society's first seances, a utopian experiment in radically alternative social structures ^[19].

After the intense period of new spiritual paths, over time, the area itself cooled considerably to spiritual practices in general,

even as some of the movements that incubated there did better elsewhere. That region, presumably for the very dynamics that made it such an intense incubator, later was inhospitable to spirituality for a time, the residents being beset with dubiousness towards such spiritual revivals. Charles Grandison Finney, a prominent leader in the Second Great Awakening, wrote of the Burned-Over District, "It was reported as having been a very extravagant excitement; and resulted in a reaction so extensive and profound, as to leave the impression on many minds that religion was a mere delusion. A great many men seemed to be settled in that conviction. Taking what they had seen as a specimen of a revival of religion, they felt justified in opposing anything looking toward the promoting of a revival ^[20].”

It is evident from this example that given the multiplicity of spiritual paths and the fact that they are not necessarily lasting phenomena among individuals or even cultures, a spiritual path is not necessarily some universal truth. However, some traditions hold themselves out as such. In fact, it is a common observation that what one individual will refer to as the one and universal truth is decried by another as a false religion, a face of evil, an abomination, heresy, or apostasy, in some cultures punishable by death. Even the same individual, over time, will renounce previous spiritual paths. It is almost as if there is an immune response, similar to perhaps the reaction to an incompatible tissue graft. Even the rejection of a previously held spiritual practice may serve some function in the larger ecology of human spirituality.

So, what description of spirituality can encompass the myriad of forms spirit can take while trying to find some way to rectify it with the need for study is a part of the science of medicine. Stripping down to as basic and universal a concept as possible may provide a map to the desired consilience, showing bridges that might not be evident

otherwise. **One definition for spirituality in this context conceptualizes it as a homeostatic mechanism for maintaining an optimal life. If life necessarily consists of instruction sets (code) and the mechanisms for carrying out the instructions, spirituality consists of routines necessary to optimize and maintain these codes of life and, by extension, the machinery to carry the codes out.** This includes any optimization routines that can affect genes (and other chemical pathways, perhaps as basic as an autocatalytic set), cultural information (memes), cognitive, emotional, unconscious, somatic, or autonomic routines, even structural or morphologically defined pathways. These are all codes or the machinery to carry the codes out. While some practices are widely understood to be spiritual, in this context, any practice that involves the maintenance of the codes of life is effectively spiritual to the degree it performs that function.

Such a definition of spirituality may appear overly broad, almost trivial, or tautological initially. However, it carries significant and often counterintuitive implications. This paper will pay particular attention to the more counterintuitive implications, exactly because they have been much less explored as topics, but the more common examples of spirituality can be seen to conform with this definition as well. Spirituality, in this context, exists because the organism exists in a complex and always changing ecosystem, so the demands on the organism change, needing a change in the code and or the machinery. In this fashion, spirituality could be viewed as an organ of Darwinian evolution. Because of the indistinct boundaries regarding what a spiritual practice is, who or what may engage in one, and at what aspect or hierarchical level of the life processes that spiritual processes are concerned with, this paradigm does not concern itself with determining those boundaries. The sole inclusion criterion is the existence of a code that must be

maintained and optimized somehow. From the perspective of the human ego, engaging in spiritual practice is familiar to it, but the same processes go on all around in the biosphere and beyond, in recognizable and still hidden ways. This is a much larger phenomenon than what humans engage in.

Exoteric religion, with its moral, behavioral, reproductive, dietary, and reflexive religion preserving commandments that have lasted over time (with clear examples, however of punctuated equilibrium), certainly qualifies as one of the more obvious approaches to optimizing the codes of life in a personal and societal sense. Others may seek more secret teachings through esoteric schools or try to find received wisdom directly, through a mystical state achieved through discipline or perhaps using an entheogenic substance. Nevertheless, the person who chops wood and carries water without wanting what they do not have may be described as spiritual, as can someone engaging in regular exercise or finding humor in a difficult situation. However, what then does not qualify as a spiritual path? What in life does not consist of optimizing the codes of life, and are there any attempts at optimizing the codes of life that would not be recognizable as a spiritual path of some sort?

Nearly all behaviors may have some impact on the optimization of how life is lived. But, beyond the guideposts provided through the teachings of family and culture, what one may do with their life is wide open, and some are undoubtedly more effective than others. There is little to define just what is meant by *optimization*. One must find or develop a suitable goal -- something being coded for that suggests optimization. Happiness, productivity, reproduction, wealth, physical health, generosity, and other possible goals limited only by the imagination are measures by which optimization can be judged. However, there would seem to be nothing to suggest that any one of them is exactly

necessary. Clearly, the code you start with at a point in time will suggest some optimization strategies over others, but the code can be changed to anything, to any degree, and the machinery of the organism will attempt to carry it out regardless of benefits or consequence. In the extreme, the boundary condition is death at a given point in time should a failure of optimization get too large, and that code no longer exists. So, even with few limits on what can be done spiritually, it would seem important to choose wisely. This is where tradition, also a code, may help by pointing out what has worked in the past. Throughout deep time, eventual extinction is the norm, but the evolution of the living has continued through constant trial and error.

One example of behavior that does not optimize code or the mechanisms to carry the code out is addiction. Addiction tends to degrade both the instruction set and the machinery and is notorious for being an example of behavior that is not spiritual ^[21]. Alcoholics and addicts behave differently when actively ill than they do pre-morbidly. The DSM 5 criteria describe the morbid behavior seen in substance use disorders. Among them and apart from the purely physiological changes includes, "A great deal of time is spent in activities necessary to obtain alcohol, use alcohol, or recover from its effects ^[22]." Somehow the codes being carried out are altered predictably by the excessive use of alcohol. Such effects of addiction may be described in terms of health, potentially from the biological health, psychological, interpersonal, and, in the case of an addiction epidemic, impacting the entire culture's health. Clearly, alcohol use disorder is an anti-spiritual practice, both as commonly understood and in the context of this schema.

Formal spiritual practices would aim to optimize the code and machinery for life in a given environment. In a self-referential step, the codification of such behaviors and their incorporation through learning and

developing a habit of them becomes, in itself, a spiritual practice. Some behaviors do not clearly affect either the code or the machinery, leading to complex results. Alcohol use disorder displaying the symptoms described above is clearly damaging to spiritual life, but moderate alcohol use can enhance it. While bicycling regularly may improve physical health, getting into a bicycle crash is likely to damage health. Bicycling may not be for everyone, depending on the judgment one tends to use while riding, but maybe a fine spiritual practice for some. There is at least some ambiguity like this in many situations.

That healthy spiritual practice may vary from one person to another is not an accident; it is a feature. Appropriate spiritual practices are context dependent. They are appropriate for the different needs people have based on their biology, family, community, physical environment, and other circumstances that would alter what changes need to be made to optimize their instruction set to adapt to the environment to maintain optimum spiritual and physical health. Further, a spiritual practice need not be intentional, conscious, or even recognized as happening by the individual, so long as it fulfills the criteria. It can be argued that the widening of the pupil of the eye to the darkening of a room in which one in has a spiritual dimension, in that it improves survival, but is relegated to the autonomic reactions under little control because, over deep time, it has needed little change.

Given the vast complexities of not only the code involved when all aspects of life are taken into account, but the environment the individual finds themselves in and given that the environment is expected to change over time, there is not a resolvable single best solution among spiritual practices, but there may be many good ones. By analogy, a traveling sales agent may need to book flights to seven cities, one after another. If they were to find the single most efficient route, they might spend thousands of years online with

the booking site figuring out the quickest and least expensive order to book them, or they may spend a few minutes on an itinerary that's good enough. Perhaps some extra effort may prove valuable, but at some point, the average person will decide that further effort provides diminishing returns. Given the complexities of life, spiritual practices to optimize routines are likewise in terms of effort made.

One aspect not covered yet is the particular value of the mystical state as a spiritual practice. The mystical state may mark direct access to certain codes of life, not easily accessible for modification otherwise. Winkelman hypothesized:

1. "The effects of psychedelics in producing visionary experiences involve the same mechanisms elicited by other non-drug mechanisms for altering consciousness and producing visionary experience; and"
2. "These mechanisms involve a disinhibition of regulatory mechanisms of the brain that releases a number of innate modules, operators or intelligences, especially the mirror neuron system (MNS) [23]."

There are observations that the mystical state may be integral to psychological health associated with the use of psilocybin [24]. Entheogens suppress the brain's Default Mode Network pathways while markedly increasing communication among regions of the brain that normally do not connect directly with one another [23]. Tasks in life are learned through repetition, and if repeated enough, are performed without conscious attention. Tasks learned so thoroughly are notoriously hard to unlearn, even when they are no longer helpful to the organism. Large volumes of object relations theory explain the emotional learning a child must undertake to become an effective adult in society. Issues with social learning at critical points in early life appear to lead to a significant number of

psychological disorders, requiring various esoteric methods to access those brain systems for reeducation [25]. Other emotional traumas sustained later in life are responsible for still more disorders, including adjustment disorders and Post Traumatic Stress Disorder [22].

Emotional problems may be conceptualized as instruction sets housed in the limbic and Default Mode Network pathways of the brain that are not optimized. The limbic system codes for tasks (such as skills in interpersonal distance modulation or social affiliation behaviors), typically learned to the point it is relegated to the unconscious for carrying out. In the case of psychiatric disorders, the machinery to carry out the code is unable to effectively do so, leading to psychic pain and or social dysfunction. In this context, at least some of the methods that reset that kind of learning appear to frequently be accompanied by the subjective sense of a mystical state, which may be induced with the use of an entheogen or through any number of spiritual practices.

One characteristic of psychedelic drugs is that they are well-known intoxicants, with acute degradation of fine detail cognition and some aspects of judgment. If only for that reason, it would be reasonable to assume that they are not particularly good agents, at least at large doses, to involve enhancements in the learning or relearning of fine details or procedures. These agents do bring emotional content to the forefront and appear to access mechanisms of social learning such as those mediated by mirror neurons [23], which is consistent with the kind of therapeutic effects observed when used to enhance psychotherapy. In this case, such treatment changes learned affectively charged behavioral routines. Once again, spirituality, this time in a mystical state, would serve to optimize the instruction sets of life and, by extension, the machinery of life.

Richard Dawkins' concept of memetics would also describe spirituality in this

evolutionary context, an outgrowth of the field of genetics in which the unit of information, rather than being the gene, is a unit concept or belief, passed from person to person culturally, called a *meme*. Memes follow the rules analogous in many ways to genes, including information replication, transmission, and mutation. Dawkins points out where memes with these characteristics are seen among non-human animals as well. He also makes the connection between religion and memetics explicit:

"Consider the idea of God. We do not know how it arose in the meme pool. Probably it originated many times by independent 'mutation.' In any case, it is very old indeed. How does it replicate itself? By the spoken and written word, aided by great music and great art. Why does it have such high survival value? Remember that 'survival value' here does not mean value for a gene in a gene pool, but value for a meme in a meme pool. The question really means: What is it about the idea of a god that gives it its stability and penetration in the cultural environment ^[12]?"

The inclusion of the concept of a deity or deities among the code-optimizing routines may not be entirely clear, but various possibilities are evident. It could be because a deity or deities actually exist in some capacity, from some self-organized meme that has its own optimization code for its environment and is merely linked to spiritual practices, much as two genetic markers are linked by being near each other on the same gene. Perhaps deities exist in some objective way outside of the meme pool, or the concept of deities are an emergent property of spiritual practices somehow. Perhaps the concept of a deity binds critical optimization code to the person using it.

Although a mystical state is one aspect of spirituality, the paradigm of spirituality as a mediator of adaptability to one's environment does not presuppose a mystical state or sense of unity or oneness with others. As a

mechanism of adaptability, one may envision spiritual practices that could be in direct opposition to the spiritual practices of someone else or even be practices forbidden in the code of society. The ritual use of entheogens has been and continues to be explicitly forbidden by society, but some spiritual practices may go further than that. While the spiritual path for perhaps most of humanity includes striving for community, love, and the unity of humankind, that is not the instruction set that everyone operates from. For instance, sociopaths have been present at least since the Epic of Gilgamesh, and the story of Cain and Abel were first told, and no doubt, well before that.

Sociopathy is one way of getting one's needs met and finding a degree of success, at least for a time. It is employed frequently enough if the size of the prison population is a measure, and those are the ones feckless enough to be caught, that it would appear sociopathy is a very common set of operating instructions. Obviously, that instruction set is very different than for others in the population. Traditional spiritual values, such as empathy toward others, are actually anathema to the sociopath. Deceit is practiced until the skill is honed, otherwise incarceration or worse awaits. That is the spiritual calling for a sociopath- to be very good at it. Other choices require far more effort to attain. In the terminology of mathematical dynamics, sociopathy is an attractor ^[26]. That the sociopath is on a spiritual path is certainly not a typical view of the range of spirituality. Nevertheless, it is seen in our religious mythology as Satan and demons and similar spirits, rejected but still eternally present in the spiritual realm.

Even far less universally reviled spiritual paths, including relatively common ones not so very different than one that has been embraced by a community at large, may be embraced by one individual but rejected by others in the community as incompatible and

treated as if it were an extreme and dangerous case. In some religious traditions, embracing a competing spiritual path may be punishable by death by the group as heresy or apostasy. This could serve to maintain the purity of the spiritual or ideological path and reject from the social group interlopers who would siphon off resources. In this sense, formal religion serves as a cultural flag, differentiating those inside from those outside a community. This is one form of code optimization and maintenance.

Conflict itself may be seen as spiritual and deeply woven into the fabric of not just human life but of all ecosystems. Billions of years of evolution on this planet and nature has never evolved out of a portion of the ecosystem being parasitic or predatory. As the Romans sacked its rival Carthage killing most of the population, enslaving the remainder, and making Carthage a Roman province, so too do similar dynamics happen throughout nature. Genetic rivals for a desired niche, even within the same species, may be destroyed, and behaviors among alpha-male predators over their rival and their rival's male offspring are observed. In the paradigm being described, this represents the dark spirit, but spirit, nonetheless. The field of game theory reveals the mathematics of these dynamics, showing that even if one were to reject the notion of taking advantage of one's neighbor in a diverse environment, one must be prepared for the possibility that another will embrace taking advantage of others, in small or large ways, to obtain resources^[13]. Those who would personally travel a spiritual path that does not embrace blood sport need to be cognizant of this side of spirituality to avoid becoming a victim and avoid enantiodromia, the becoming of which one renounces. All living creatures have, in some form, defenses to protect them from assaults on their resources. In human society, there are many examples of warriors as a part of a spiritual path, such as the Shaolin monks and

the Knights Hospitaller. This is also why many spiritual paths include what Carl Jung referred to as *Shadow Integration* work to avoid unintentionally turning to the darker side of spirituality^[27].

What forms might instruction sets take? They have been seen to come in more than one distinct form, including beliefs and concepts (memes) and actual genetics. As described here, there is no specific reason obvious to the author that where there is an instruction set and the machinery to carry it out, there is not also spirit. This would imply that a spirit could not just be found in other animal species but in systems not recognized as living. Cellular automata, genetic algorithms, and even artificial intelligent systems, at least in their working environment, would qualify as spiritual in this context unless a compelling argument could be found to the contrary.

IMPLICATIONS FOR RESEARCH

While there have always been ways to create data from aspects of spirituality, even if using behavioral proxies such as minutes a week spent in meditation or monies given to charity, measurement of mystical states can be accessed through questionnaires that use endorsing the common subjective elements of these states. Hill and Edwards identified approximately two hundred twenty-five distinct psychometric instruments for measuring religiousness and spirituality between 1984 and 2011. However, certain issues have posed recurrent issues in developing working universal psychometric instruments for these practices. One limitation is that most are culturally defined, typically towards subjects from a Judeo-Christian tradition, and the measures might not be valid for people of a different culture. Further, "the significance and meaning of research findings are undermined if the research itself, including the crucial element of measurement, lacks conceptual clarity. During what Gorsuch called the

measurement paradigm, the pull toward establishing a strong empirical framework often led to measures that, while psychometrically sound, were often without a clear theoretical grounding... Despite the initial promise as a guiding theoretical framework, the study of religious orientation soon became enmeshed in measurement issues to the point that it lost sight of its theoretical groundings [28]."

This paradigm assumes a wide variety of orientations to spirituality, expecting that different individuals and cultures will find different, sometimes vastly different approaches to resolving spiritual issues. Psychometrics may be developed that are not so dependent on cultural considerations when the issues being measured are more fundamental than the boundaries defining culture. Searching for a hypothetical objective, measurable unit of spirituality, the *numin* while an admirable goal, the paradigm outlined here would not be so complete or accurate as to be able to claim anything of the sort. It may, however, represent a philosophical step in that direction with some potential concrete benefits that the field has been lacking to some degree.

First, to the extent it represents a definition that both scientific researchers and practitioners in traditionally spiritual fields can agree on, it helps unify the theoretical underpinnings that can be used to bridge the two. This is likely more dependent on the relatively objective description of spirituality that rather widens the definition to encompass issues that may not be typically envisioned as spiritual, and which some spiritual thought leaders might not agree with.

From the scientific standpoint, using a framework of instruction sets that might not always be easily measurable could also pose a problem when designing a research protocol. Even so, some codes are quite scientifically described; genetic codes have been cracked, and it is a nominal cost to have one's

own genetics analyzed at this point. The social sciences have been grappling with issues of working with the code of early social learning-based instruction sets, limbic system-mediated psychiatric symptoms for some time, and theories have been developing from biological, psychological, and social perspectives that have been used to create treatments for some of the same issues for which certain spiritual paths have also provided relief. To date, however, describing the two approaches has been an apples-to-oranges comparison. To the degree this paradigm represents the truth for both fields, it may represent the beginnings of an apples-to-apples comparison and an aid to tools to measure the benefits of a spiritual experience with the tools of scientific research.

Beyond relying on subjective inventory-type questionnaires to create some form of objective data, one could envision improved objective, if nominal, data determined by the clinician, with a measure of the quality of the data being the degree of interrater reliability. One model for this already exists in psychotherapy research, that of research on Beck's Cognitive Therapy, in which an interview with the subject allows the clinician to determine the nature of the subject's core beliefs and automatic thoughts [29]. This is exactly about defining and updating psychological code of the sort that the mystical experiences provided by psychedelic-assisted psychotherapy also seem to reach. Once used to thinking about this new paradigm, it is unsurprising that engaging in psychotherapy qualifies as a spiritual practice.

For this paradigm to be of use in the real world, it would require that the arguments behind the main postulate stand up to criticism, or at least be a stepping-stone towards stronger arguments later. They should represent fundamental enough concepts that they do represent a theoretical consilience bridging spirituality and research, and in the end, they need to lead to some real

improvement in how research is conducted into spiritual matters. It is reasonable to postulate a completely different paradigm that leads to a similar or even better consilience. Work towards this does need to continue, and perhaps this is a step in the right direction.

AUTHOR INFORMATION

Send correspondence to Thomas. Meacham, MD (tmeacham@gmail.com)

Meacham, T. (2021, March). Towards Consilience Between Research Paradigms and Spiritual Practice, 3(1).

ACKNOWLEDGEMENTS

Adapted from an academic paper submitted for course completion to California Institute for Integral Studies, Certificate in Psychedelic Assisted Therapy and Research.

REFERENCES

1. Wilson, E.O. *Consilience The Unity of Knowledge*. s.l. : Alfred Knopf, 1998.
2. Spiritual | Definition of Spiritual by Merriam-Webster. [Online] January 3, 2021. <https://www.merriam-webster.com/dictionary/spiritual?src=search-dict-box>.
3. Richards, William A. *Sacred Knowledge Psychedelics and Religious Experiences*. New York : Columbia University Press, 2016.
4. *The challenging task of defining spirituality*. Jastrzębski, Andrej K. 2020, Journal of Spirituality in Mental Health.
5. Mystical | Definition of Mystical by Merriam-Webster. [Online] January 23, 2021. <https://www.merriam-webster.com/dictionary/mystical>.
6. James, William. *The varieties of religious experience : a study in human nature : being the gifford lectures on natural religion delivered at edinburgh in 1901-1902 (Ser. Gifford lectures, 1901-1902)*. <https://hdl-handle-net.ciis.idm.oclc.org/2027/heb.03466> : Modern Library, 1929.
7. Events - AISB - The Society for the Study of Artificial Intelligence and Simulation of Behaviour. [Online] January 23, 2021. <https://aisb.org.uk/aisb-events/>.
8. Dick, Philip K. *Blade Runner*. New York: Ballentine, 1982.
9. *Vocabulary of Definitions of Life Suggests a Definition*. Trifonov, Edward N. 2011, Journal of Biomolecular Structure and Dynamics 29:2, pp. 259-266.
10. Aspray, William. *John von neumann and the origins of modern computing*. Cambridge, MA: MIT Press, 1990.
11. Białynicki-Birula, I., & Białynicka-Birula, I. *Modeling reality: how computers mirror life*. s.l.: Oxford University Press, 2004.
12. Dawkins, Richard. *The Selfish Gene: 40th Anniversary Edition*. s.l.: ProQuest Ebook Central, 2016.
13. Hofstadter, Douglas. *Metamagical Thomas Questing for the Essence of Mind and Pattern*. s.l.: Basic Books, 1985.
14. Rucker, Rudy. The lifebox, the seashell, and the soul: what gnarly computation taught me about ultimate reality, the meaning of life, and how to be happy. New York: Thunder's Mouth Press, 2006, p. 5.
15. *Consciousness: Here, There and Everywhere?* Tononi, Giulio and Koch, Christof. 1668, March 2015, Philosophical Transactions of the Royal Society B: Biological Sciences, Vol. 370, p. 1668.
16. Ubiquitous Minds. *Scientific American Mind*. January 2014, Vol. 25, 1, pp. 26-29.
17. Teehan, John. *In the Name of God The Evolutionary Origins of Religious Ethics and Violence*. s.l. : Wiley, 2011.
18. Pargamet, K.I., Mahoney, A., Exline, J.J., Jones, J.I., Shafranske, E.P. Envisioning an integrative paradigm for the psychology of religion and spirituality. [ed.] K.I., et al. Pargamet. *APA Handbook of Psychology, Religion, and Spirituality: Vol.*

- 1. Context, Theory, and Research.* Washington, D.C.: American Psychological Association, 2013, 1.
19. *The Burned-over District: The Social and Intellectual History of Enthusiastic Religion in Western New York, 1800–1850.* CROSS, W. Ithaca: Cornell University Press, 1950.
 20. Finney, Charles G. *An Autobiography.* 1908.
 21. *Conceptualizing Religion and Spirituality: Points of Commonality, Points of Departure.* Hill, Peter C, et. al. 1, Journal for the Theory of Social Behaviour, Vol. 30, pp. 51-77.
 22. American Psychiatric Association. *Diagnostic and Statistical Manual of Mental Disorders: DSM-5 (5th ed.).* s.l. : American Psychiatric Association, 2013.
 23. *The Mechanisms of Psychedelic Visionary Experiences: Hypotheses from Evolutionary Psychology.* Winkelman, Michael J. September 28, 2017, Frontiers in Neuroscience.
 24. *Psilocybin-occasioned mystical-type experience in combination with meditation and other spiritual practices produces enduring positive changes in psychological functioning and in trait measures of prosocial attitudes and behaviors.* Griffiths, R. R., Johnson, M. W., Richards, W. A., Richards, B. D., Jesse, R., MacLean, K. A. 1, 2018, Journal of Psychopharmacology, Vol. 32, pp. 49–69.
 25. Kernberg, O.F. *Object Relations Theory and Clinical Psychoanalysis.* s.l.: Jason Aronson, Incorporated, 1995.
 26. Shaw, C. D., Abraham, R., Abraham, F. D. *A Visual Introduction to Dynamical Systems Theory for Psychology.* s.l.: Aerial Press, 1990.
 27. Casement, Ann. *The Shadow.* [ed.] Renos K. Papadopoulos. *The Handbook of Jungian Psychology: Theory, Practice and Applications.* s.l.: Taylor and Francis, 2012, 4.
 28. Hill, Peter and Edwards, Evonne. *Measurement in the psychology of religiousness and spirituality: Existing measures and new frontiers.* [ed.] K. I. Pargament. *APA Handbook of Psychology, Religion, and Spirituality: Vol. 1. Context, Theory, and Research.* Washington, DC: American Psychological Association, Inc, 2013.
 29. *Automatic Thoughts and Cognitive Restructuring in Cognitive Behavioral Group Therapy for Social Anxiety Disorder.* Hope, Debra A., et al. 1, February 2010, Cognitive Therapy and Research, Vol. 34, pp. 1-12.

