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Converging Views in Buddhism and Quantum Mechanics: Advancing Understanding of the Self, Reality and Mental Suffering

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Abstract. Questions regarding the nature of consciousness, self and objective reality have fascinated thinkers since the dawn of human history. While scientists seek to understand reality through examination of the external world, mystics seek this understanding through examination of their inner world. In Buddhism, deeper meditative enquiry into such questions typically involves the cultivation of a nondualistic mode of being, and the direct experience of reality through *śūnyatā* (translated from Sanskrit as "emptiness"), wherein "absolute" reality is experienced as empty of inherent existence. In physics, examination of objective reality reveals a similar vision in which the ordinary world is underpinned by an indeterminate "quantum field" which describes the world purely in terms of probabilities, and wherein physical entities lack inherent existence. In this context, the concept of a "state-vector collapse" has gained traction as a way of explaining how this nascent realm of possibility condenses into the "real world" we see around us. This paper explores these areas of convergence to shed light on such questions and examines their potential to advance psychological and wider scientific understanding of the underlying nature of consciousness, selfhood and reality. The implications for mental health and concurrent disorders are also discussed.

Keywords: Emptiness, Sunyata, Buddhism, State-Vector Collapse, Quantum Physics.

Introduction

The nature of our embodied selves and the universe in which we exist has captivated thinkers since the dawn of human history. Scientists typically pursue understanding through examination of the external world, while the mystic seeks answers through examination of their inner world. In Buddhism, such examination is largely framed within an enquiry into the nature and causes of human suffering, however the deeper metaphysical exploration that this entails involves the cultivation of profound insights into the nature of consciousness, self, and reality.

Central to the teachings of Buddhism is the premise that the world is subject to perpetual change or impermanence (Sanskrit: *aniccā*). Given that phenomena are permanently in a state of transience, Buddhist teachings assert that they are devoid of an inherently existing self (Shonin et al., 2014). As a result, all phenomena, including humans, are of the nature of "non-self" (Sanskrit: *anattā*) and therefore inherently "empty" as they exist only in a relative sense (Nagarjuna, 2005). This "emptiness" that underpins all reality is called *śūnyatā*, and is a founding principle of Buddhist thought considered fundamental to many strands of Buddhist teaching (Humphreys & Hodge, 2003). However, it is a term that is often misunderstood. Emptiness in Buddhism does not literally mean that things do not exist, but that they exist only in a relative manner as an indivisible component of an interconnected whole (Van Gordon et al., 2017).

One way of understanding *śūnyatā* is through related Buddhist principles of interconnectedness and interdependence. A human being, for example, is composed of and dependent upon water (from rivers, oceans or the rain), nutrients (from plants or animals), air (from our atmosphere), and warmth (from sunlight or shelter). Therefore, we can speak of a human body (or anything else) as being "full" of all things, yet "empty" of an inherent and independently existing self (Shonin et al., 2014). Consistent with this, *śūnyatā* is also sometimes translated as "boundlessness," underlining the truth that it is impossible to draw absolute boundaries between one thing and another.

Another way of understanding this is by viewing reality as something akin to a dream. Things in a dream may appear and behave just as they do in waking reality, so it would be wrong to speak of a dream as being devoid of existence. Dreamt phenomena have existence but only as a psychological projection constructed by the mind. However, Buddhists would argue that this is not significantly different to how things exist in what we call the "real world;" things in the world have the appearance of solidity and form but only as a psychological construction derived from sense data. One might protest this comparison on the grounds that the latter construction is based on real things in an external world, but such an "external world" implies the existence of an inherently existent self to which other (inherently existing) things must be external. Reality, then, is likened in certain Buddhist teachings as something akin to a shared dream or mental projection, but one which adheres to particular rules and which one

experiences within the duality of self and other (Van Gordon et al., 2017). Indeed, some adepts argue that there is no rational way to distinguish between how things exist in a dream, and how they exist in waking reality (Shonin & Van Gordon, 2014)

The advanced, wisdom-based meditative techniques employed by Buddhism are intended to create the conditions whereby a person can directly experience these insights through transcendence of the ordinary world (*samsara*) and the cultivation and attainment of *nirvana*, a nondualistic mode of being through which "absolute" reality—*śūnyatā*—can be apprehended directly. However, it must also be stressed that *śūnyatā* is not some otherworldly realm but comprises the very fabric of the reality we experience in the here-and-now (Van Gordon et al., 2021; Van Gordon et al., 2017). The world as viewed from a Buddhist standpoint bears a striking resemblance to the nature of the world as envisaged by more recent historical developments in physics, and it offers a way of understanding philosophical problems relating to consciousness, free-will, and even time. The present paper appraises some of these areas of convergence and argues that a relative-state, "many-worlds" interpretation provides a more logically satisfying answer to key philosophical problems in quantum physics, and one which parallels these ancient Buddhist teachings regarding the nature of consciousness and reality. The implications for mental health and concurrent disorders are also discussed.

Physics and the observer problem

Under the traditional Newtonian or "classical" view of physics, the universe is seen as akin to a vast kaleidoscope of matter and energy, iterating eternally through an infinite series of combinations according to immutable and preordained laws (Dolnick, 2011). Enshrined within this view are a set of overarching ontological principles. Amongst these are that physical entities exist on a backdrop of space and time, are localisable, and are confined to definite places and times. These entities have different and independent inherent properties which also have values and magnitudes independent of the properties of other entities.

In contrast to this, quantum physics has seen the advent of principles that violate these premises. In complementarity, the fundamental components of matter behave both as distinct, localized particles and as nonlocal waves (Dimitrova & Weis, 2008; Wootters & Zurek, 1979; Yuan et al., 2018). Atomic theory relies upon principles that violate locality (Kaplan, 2017; Pauli, 1925), and quantum entanglement allows for the interdependence of entity properties even when they are separated by vast distances (Einstein et al., 1935; Reid et al., 2009; Weinstein, 2020).

Of fundamental significance here is the principle of indeterminacy, which appears to undermine our most common-sense notions of objective reality. For example, an electron does not follow the simplistic notion of a pellet orbiting a nucleus like planets around a sun (Bohr, 1913; Peierls, 2010; Podgoršak, 2016); it is more akin to a field of probability, as dictated

by the famous Schrödinger wave equation. Because everything is made up of atomic and subatomic particles, it implies we are living in a quantum world, whereby classical physics can be viewed as a useful approximation of a world which is quantum mechanical at every scale. In this widely supported view, "quantum fundamentalism" represents both an ontological and epistemological position wherein the wave-function description offers a literal description of the structure of the world.

If this is true, then every system of matter at every order of magnitude should consist of a superposition of different states because a combination of wave-functions is also a higher order wave-function. Therefore, an observer conducting an experiment using an apparatus to observe an atomic event becomes a dynamic whole in the form of an "entangled" quantum system. The problem comes, however, when we try to explain the point at which the observer and instrument enter a determinate state. When an experiment is performed to measure the precise location of a particle, for example, physicists talk about a wave-function (or "state-vector") collapse brought about by the act of observation itself, where reality is "forced to choose" a form and "make a decision" about how it appears to us. This is the essence of the observer problem of physics.

This problem brings us to the well-known reductio ad absurdum best exemplified by the famous Schrödinger's Cat thought experiment (Gribbin, 2012; Trimmer, 1980). In this hypothetical scenario, a button with a 50/50 chance of destroying a cyanide capsule (determined by the radioactive decay of an isotope) is rigged up to an opaque box containing a cat; if the button is pressed but the box is not opened, it is argued that because both possible outcomes exist purely as probabilities at the quantum level, there exists in the box all possible "dead-cat" worlds superimposed on all possible "alive-cat worlds." But it is not until the box is opened that observation somehow forces a decision between one and the other.

However, in order to reconcile this worldview with the experience of a single cohesive reality, one faces a particularly stark choice. On one hand, one could reinstate the kind of dualism of Descartes through some deus ex machina as in some of the more exotic interpretations of the Anthropic principle (Gale, 1981; Rabounski, 2006; Smolin, 2004). In one such proposed scenario, human minds uniquely possess some strange power by which—through the mere act of experiencing the world—they condense a deterministic world from a cloud of nebulous probability, with individually constructed worlds (or wave-functions) patching themselves together as they overlap and become shared reality. This dependence of collapsed reality on some act of observation quickly becomes impossibly complex and raises many unanswered questions.

The general depiction of the world in terms of probabilities of the Schrödinger wave equation that somehow collapses into the single outcome we occupy in the macroscopic world has become known as the "Copenhagen Interpretation" of physics. Because the underlying equations

appear to so perfectly explain the most intricate workings of quantum mechanics, many have been content to tolerate (or even just ignore) its troubling philosophical baggage, and it arguably still remains the most widely supported of the available interpretations (Becker, 2018; Tegmark, 1998).

Rejecting the notion that there is something special about a human observer that demands that the world resolve itself into a single configuration, one is left with more and more questions because this viewpoint ultimately leads to a kind of solipsism whereby a single observer becomes the exclusive and ultimate arbiter of their own, unique, collapsed universe. On the other hand, one faces an alternative that seems on the face of it almost as extraordinary, which is that our conscious experience represents just a single "solution" out of an infinite range of possible realities—the "relative state" or "many worlds" interpretation (DeWitt, 2015; DeWitt et al., 1973; Everett, 2015) which sidesteps this problem. According to this view, there *is* no state-vector collapse, and all possible solutions to the Schrödinger wave equation represent complete realities within their own right, which are ontologically self-contained and exist only in a relative sense.

However, some alternatives have been proposed to preserve a deterministic order, within which the unquestionably real predictions of quantum theory can co-exist with a single collapsed reality. The de Broglie-Bohm "pilot-wave theory" attempted to reimpose determinism by added a guiding equation to the wave-function that objectively described a configuration of particles which exist even when unobserved (Bohm & Hiley, 2006; Norsen, 2017). However, recent re-examination of this reveals an apparent failure to account for the "empty branches" of alternative possible worldlines; when corrected for this, the de Broglie-Bohm theory, it is argued, becomes identical to DeWitt and Everett's many-worlds formulation (Joris Boström, 2012). Another attempt to avoid the observer problem is "spontaneous-collapse theory," in which the wave-equation is subtly tweaked to allow a collapsed world which is observer free. However, testing the modified version has proved problematic (Diósi, 2017; Lewis, 2005), and the rise of cosmology in the late twentieth century saw the many-worlds interpretation gain considerably more popularity and notoriety (Becker, 2018).

This apparent disconnect between modern physics and our most cherished notions of objectivity and agency have been debated extensively over the years, as have the strange emerging parallels between the world as revealed through spiritual or meditative practice and the one revealed through the deepest examination of physical reality (Barrows, 1998; Capra, 1975; Gribbin, 2012; Koestler, 1974). Though modern psychology understands that the self is ultimately a construction of one's own psyche, the deeply ingrained habit in Western culture of viewing the self as a fixed entity with clear physical and behavioural attributes—a container for our thoughts and feelings—still dominates the theories under which many

psychological models and psychiatric interventions function (Clark, 2016; Freud, 1961; Maslow, 1943; Rogers & Koch, 1959).

The dichotomy of these classical and quantum interpretations of physics are profoundly mirrored in Buddhist metaphysics. The Buddhist concept of *śūnyatā*, we propose, is essentially identical to the modern physicist's conception of objective reality at its deepest level, a quantum field which describes and contains all possible configurations of reality, but which is ultimately seated in nonduality and paradox. This vision is echoed by the *Heart Sutra*, a fundamental Buddhist teaching on emptiness which asserts that "form does not differ from emptiness, emptiness does not differ from form" (Soeng, 1995, p. 1).

Deep contemplative examination of our inner world reveals that we are *anatta* – devoid of an inherently existing self (Van Gordon et al., 2017). Similarly, deep examination of the physical world reveals that particles cannot be viewed as independent entities with inherent properties, but rather as inseparable components of a dynamic whole in which properties are fundamentally interdependent. In the words of Neils Bohr (1937), "the whole situation in atomic physics deprives of all meaning such inherent attributes as the idealization of classical physics would ascribe to the object" (p. 293).

Consciousness, free-will, and determinism

These core concepts of Buddhism offer some interesting insights into the most fundamental philosophical conundrums relating to mind, consciousness, and free-will. The so-called "mind-body problem," for example, embodies two key questions relating to selfhood: (i) our experience of consciousness as a single, unified whole; and (ii) the apparent ontological contradiction of subjective and objective (or "mental" and "physical") frames of reference.

Regarding the first point, we do not experience ourselves as a collection of neurons, but as a unitary field of awareness. Authors such as Zohar (1991) have conceptualised the quantum field as the ultimate seat of consciousness, wherein composite quantum fields at the neurological scale give rise to the sense of the imputed self as a unitary entity. The second point is more fundamental though and is often conflated with the first. It concerns the fundamental relationship between consciousness and objective reality, and the mystery of how and under what circumstances consciousness arises.

Proposed models of this relationship span a range of both monist and dualist conceptualisations. Monist perspectives often take viewpoints in which either one or the other is considered primary. Physicalist positions typically characterize consciousness as some kind of emergent property of brain processes (Davidson, 1970) whereas mentalist perspectives reverse this relationship, viewing consciousness as primary and the objective world as something simply akin to a dream constructed out of "mind-stuff" (Eddington, 1929). In alternative conceptualizations, while monism is

preserved, the ontological nature of reality is often framed as a mysterious "third stuff" from which both levels arise, as in various formulations of dual-aspect monism (Atmanspacher, 2012). Dualistic conceptualisations such as that of Descartes, in contrast, assert ontological distinctions between mental and physical classes of events, but struggle to reconcile these, either proposing a kind of interactionism wherein the two levels communicate at some mysterious juncture (Popper & Eccles, 1977), or a parallelism by which both remain in perfect lock-step with one another through some preestablished harmony (Lodge & Bobro, 1998).

This debate will be all too familiar to some followers of Buddhist teachings, as this subject-object duality is a key focus of metaphysical inquiry into the nature of self. In Buddhism, transcendence of dualistic modes of awareness through *nirvana* and the experience of an ontological ground in the form of *śūnyatā* are viewed as offering profound insights in this respect (Van Gordon et al., 2021). Furthermore, if the quantum world is simply the physicist's formulation of *śūnyatā* then there are a number of implications. These implications relate to (i) the concept of the state-vector collapse, (ii) free-will and determinism, (iii) consciousness and selfhood, and (iv) the nature of time.

Firstly, we would argue that *śūnyatā* suggests, as advocates of the many-worlds interpretation believe, that there is no state-vector collapse, wherein reality "chooses" which nascent potentialities become manifest *per se*, but that each possible world contains within itself its own reality unknowable to the others. *Śūnyatā*, in the context of physics, might further be envisioned as ontologically equivalent to the quantum field, the seat of reality as it is understood, and within which exists the universal wave-function encompassing the totality of all possible worlds (DeWitt, 2015; DeWitt et al., 1973; Everett, 2015). Here, every permutation of all possible entities and every subsequent possible iteration throughout time exist as countless mathematical worldlines mapping their own unique version of history.

The shortest meaningful unit of time in physics (Planck time) is 5.4 $x10^{-44}$ seconds. So, at each of these infinitesimally tiny junctures the universe can be viewed as branching out into innumerable possible states, all of which are relatively real, but mutually exclusive with the others. Hence, these "many-worlds" would not be the parallel dimensions envisaged in popular fiction, which may be traversed by some exotic technology, but ontologically relative standpoints whose "collapsed" forms cannot coexist.

At this point it should be made clear that although we propose an equivalence between the ontological ground of the quantum field and the Buddhist conceptualization as *śūnyatā*, we are not suggesting that Buddhist meditators are somehow "doing quantum physics" or experiencing in some strange fashion the mathematics of the Schrödinger wave equation, neither are we asserting that physics somehow "proves" the entire corpus of Buddhist teachings. Rather, we are asserting that, whether questions are

pursued about the nature of reality through experimentation with the building blocks of matter, or through contemplative spiritual techniques, we arrive at the same essential "bedrock" reality. In the former, this reality is expressed as a mathematical description of all possible states, whereas in the latter it is experienced directly as an *a priori* truth. This latter experience is quintessentially metaphysical but contains within it a distillation of the principles of non-self, interconnectedness, interdependence, relativity, and non-duality that embody both Buddhist teachings as well as important philosophical and epistemological features of physical theories. On the point of free-will and determinism, the lack of inherent existence of the self (*anattā*) renders notions of individual choice or agency as also inherently empty. "Free will" therefore becomes a psychological and linguistic convenience for accounting for our embodied experience of modelling how our role in past or future events unfolds. Furthermore, by accepting the ontological relativity of possible future outcomes and their probabilistic nature, there is no single-outcome determinacy of the type that Newtonian physics would propose in which the universe plays out a single, causally inevitable sequence of determined events from the beginning of the universe to its end.

As regards consciousness and selfhood, this too is somewhat self-explanatory in terms of how one conceptualizes consciousness and reality because much of Buddhist teaching centers on the relative, nondualistic and interdependent nature of subject and object (Shonin et al., 2014). Essentially, mind-body dualism is viewed as something akin to the wave-particle duality of physics, wherein reality manifests both as objective ("matter-centred") and subjective ("mind-centred") frames of reference. Fundamental to this is a monism encompassing numerous paradoxes which can only be understood through transcendence of the ordinary world (*samsara*) via the experience of nonduality in *nirvana* (the realisation of *śūnyatā*). There is no need, here, for any "ghost in the machine," and ontological dualism is rejected as one of many delusions to be undermined by deeper examination of the nature of phenomena.

However, the conception of one's apparent unity of conscious experience being based in the quantum field does raise some interesting possibilities regarding the forms that selfhood might take. Quantum fields are not restricted to single electrons or atoms but can also be conceptualized as composite hierarchically organized wavefunctions spanning all orders of magnitude of physical matter. Some (Zohar, 1991) argue that our unitary sense of consciousness is due to the quantum field encompassing the neurological scale, but if this is the case, might not different levels or layers of self also exist?

In Sperry's (1968) famous experiments on split-brain patients, compelling evidence emerged that each hemisphere of the brain can respond to and interact with the world independently if the contralateral hemisphere of such a patient is anaesthetized, suggesting that consciousness (or "self") as one understands it is divisible. If quantum fields at all levels can delineate

the cartesian divide, then it might also be possible that lower and higher orders of selfhood exist. A rudimentary consciousness might also exist at the molecular, cellular and organic level, and higher levels of "selfhood" may extend to couples, social groups, societies, nations, or even to the universal scale as a "God-mind," akin to the *Brahman* of Hindu theology. The malleable nature of selfhood and the boundaries of conscious experience suggested by such an account might go some way towards explaining the variety of mystical experiences reported by those pursuing transformation or insight through meditation or other religious practice. The self-transcendence inherent to many of these practices can be framed as the erosion of the field of ordinary self to allow deeper union with higher-order levels (or fields) of consciousness, culminating in the experience of consciousness-without-self or a sense of self which is profoundly transpersonal, such as with the experience of *śūnyatā*.

The panpsychism inherent to such a view, however, does raise some interesting (and perhaps unnerving) possibilities regarding the increasing complexity and intelligence of the technology that permeates our everyday existence because it rejects any vitalist notions of consciousness as some magical epiphenomenon of organic life. The vast and intricate information and communications network spanning the planet may itself be underpinned by a nascent consciousness, and as artificial intelligence evolves and human thought and behaviour become more closely imitated by deep-learning networks, humans may eventually have to confront the question of the status of artificial life, and whether such apparent imitations are as "real" as we appear to be to ourselves.

Finally, the duality between the indeterministic quantum world and the "collapsed" macroscopic world may offer insights into the mysterious "arrow of time" through which our experiences appear to be organised into successive moments. One might envisage a temporal relativism by which all possible moments (or collapsed configurations of the universal state-vector) exist as a self-experienced "now." These moments "see" past states as collapsed certainties of which they are a determined culmination, but also "see" the future as an opaque, indeterministic wall of unmanifest possibility. In this way, all junctures following worldline solutions for the universal wave-function are experienced as innumerable timelines, where one moment appears to give way to the next in an endless progression. However, as with *śūnyatā,* this appearance of motion and time is inherently empty; the stripes on a barber pole appear to move ever upwards despite the lack of any vertical motion, while motionless images of complex geometry give the illusion of shifting or rotating. In the same way, it is the juxtaposition of the entirety of these interdependent states that gives rise to the illusion of moment-to-moment sequence and the flow of time.

Implications for mental health and concurrent disorders

According to an emerging metaphysical model of human suffering and mental illness called ontological addiction theory (OAT), beliefs that

run contrary to relating to the ultimate nature of self and reality as being empty of intrinsic existence are responsible for propagating mental suffering (Barrows et al., 2023). Ontological addiction, which essentially means being addicted to our beliefs concerning how we think we exist, is defined as "*the unwillingness to relinquish an erroneous and deep-rooted belief in an inherently existing 'self' or 'I' as well as the 'impaired functionality' that arises from such a belief*" (Shonin et al., 2016, p.661). According to OAT, believing that they exist in the intrinsic sense of the word causes a person to relate to phenomena as also intrinsically existing, albeit as something separate from themselves (Barrows et al., 2024). This leads to a person becoming attached or averse to such phenomena due to a dualistic (self-other) perspective based on whether they deem the phenomena to be something that can help or hinder their situation (Van Gordon et al., 2018). Therefore, ontological addiction arises due to a persistent belief in intrinsic self-existence, which is reinforced via an addictive feedback loop each time an individual relates to phenomena as being external to themselves (Barrows & Van Gordon, 2021). In other words, the more an individual sees themselves as intrinsically self-existing, the more they relate to phenomena as separate from themselves and the more they want to either attract or repel such phenomena (e.g., people, material possessions, situations, feelings etc), which in turn reinforces their belief in an inherently existing self.

According to OAT, ontological addiction can be seen as an ailment in its own right but also as a condition that underlies and occurs concurrently with all other forms of mental suffering. From this point of view, ontological addiction might be seen as the "mother" of mental suffering and the "sibling" of specific mental illnesses in their diagnostic sense. In essence, according to OAT the extent to which an individual experiences mental suffering is intrinsically linked to their view of themselves and the world around them as delusional (Van Gordon et al., 2019), which seems to overlap with the aforementioned quantum mechanics position that an individual becomes the exclusive and ultimate arbiter of their own relative collapsed universe, which is unique yet also inseparable from the wider quantum field of infinite probabilities that exists beyond the confines of space and time.

Conclusions

Far from being undermined by science, principles inherent within the worldview of many ancient spiritual practises have been rediscovered through the deep examination of the physical world. Ancient Buddhist teachings on the nature of reality, and core concepts such as *samsara*, *nirvana*, and *śūnyatā* mirror the deeper reality as unveiled by physicists, and both perspectives provide convergence that yields important insights into the nature of consciousness and reality. In particular, it appears that the state-vector collapse of physics is a myth, and that a relativist, many-worlds interpretation better reflects the nature of reality. Dualist accounts of

consciousness are likewise rejected in favour of a neutral monist view in which the physicist's notion of the quantum field and the Buddhist concept of *śūnyatā* are viewed as essentially interchangeable, as well as the ultimate root of all phenomena. Taken together, these two perspectives shed light on ancient philosophical questions such as the mind-body problem, free-will, and the nature of time, and they offer an intelligible and more logically satisfying perspective on the nature of physical reality as well as the underlying cause of mental suffering, which arises due to and concurrently with a flawed belief as to the true nature of the self.

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