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Mutuality of Mind and Body: Role of Supernatural Elements in Human Well-being

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Essentially the aim of applied psychology is to use the advances in the science of mind for understanding human mental processes and to modify human behavior and attitudes. In this attempt human brain and physiology are thought as mediating mechanisms and remain poorly understood by the students of applied psychology. In view of this indifference, the report of World Health Organization on mental health in 2001made a significant attempt by highlighting the advances in the brain sciences, on the one hand, and parallel developments in cognitive sciences, on the other hand. These advances additionally support the resolution of the World Health Organization to underline the mutuality of mind and body for understanding mental health. However, this most enlightening message of the report went unnoticed by the mental health professionals. The mutuality of mind and body has fundamental significance for applied psychology, in theory as well as practice. The issue is, does mind change brain (neuroplastic mechanism) and in turn behavior? And, conversely, does behavior change brain (feedback mechanism) and in turn mind. The life-long work of quantum physicist E. C. G. Sudarshan, a modern *rishi*, illuminates the disappearance of veil between mind and matter (body or brain). The present paper reviews evidence from research conducted over the past decade that further strengthens the mutuality of mind and body (brain), especially in context of the role of supernatural elements in human well-being.

Keywords: Consciousness, mind-brain-mind, quantum Zeno effect, mental effort, religious experiences

In its journey for over one hundred year, psychology has slowly evolved as a science of human mind by developing various ways to analyze and predict human thought, affect and behavior. These ways include mental tests, behavioral observations, and neuro-physiological changes to arrive at some understanding of human mind. Hypothesizing evolutionary continuity, even various animal species served as models of human mental functions. There has always been a hidden assumption about the relationship between the agent and its mind. The agent may be a group, an individual, a body, a brain, or even a neuron. All of them share a common feature, the material existence. While mind do have material properties, but essentially its nature appears beyond the measures of matter related to time, space and substance. This is known as Cartesian dualism—the mind and the body are separate.

But the implied association between mind and body is so ubiquitous that its duality has been an issue of recurrent debate. It has been assumed that matter (brain or body) is real, but its product (mind) does not have material properties. Perhaps psychology has had this assumption since its beginning, and additionally various other disciplines also implicitly or explicitly abide by this assumption.

There have been attempts to situate an enquiry either in the mental or in the material domain. In early twentieth century, Freud, a physicalist (he was neurologist) in developing the architecture of mind became a psychiker. He placed psychoanalysis in the mental domain, and used its concepts to explore the functioning of mind. On the other hand, almost during the same time, behaviorists situated themselves in the material domain and successfully developed ways of exploring human mental processes. Later, from the middle of the twentieth century, neuropsycholgy and cognitive psychology used mental as well as physical domains to understand mind. And the discoveries in these branches of psychology were crucial in developing a view of the nature of association between mind and brain. The mind-body issue became more conspicuous as scientists began exploring the universal and yet highly elusive phenomenon of human consciousness.

The subjective nature of mental experience obscured its measurement on classic assumptions of the nature of matter, and the chasm has persisted between mind and matter. However, it occurred to some physical scientists that the discrete particles (or quanta) that constitute matter are highly unstable, and the quantum nature of matter varies significantly from the classic view of physics about matter. In other words, the way we have been thinking about matter on the basis of classical physics has been challenged by the new understanding given by quantum physics. In their quest the quantum physicists wondered into a world of mental abstraction, using the language of mathematics, and found extremely fascinating phenomena. Reductionism becomes absurd when the scales of time and space go beyond common man's imagination in the measurement of the universe or a discrete particle. Neither human mind nor any machine is able to apprehend the discrete particle that may be the constituent of matter. The accompanying phenomena are even more startling as these are not the kind of changes to which our mind is accustomed, as they are characterized by indeterminacy.

The life-long research, referred in the following section, of the well-known quantum physicist E. C. G. Sudarshan, a modern *rishi*, illuminates the disappearance of veil between mind and matter. It is he, more than anybody else, who has been curious about *mind* and *matter*. Sudarshan explored the mind by diving deep as Samkara. But he did explore matter using the universal tool of abstract science, the mathematics. The 'monism' of Vedic science of Samkara harmoniously blends with the 'monism' of quantum science of physics in Sudarshan's quest of mind. Nobel Laureate C. V. Raman also visualized such a union when a wave carrying certain quanta of light falls on our eyes and we perceive a particular color or hue (Raman, 1962).

A phenomenon that make it easier to comprehend the ideas of Sudarshan is the quantum Zeno effect, named after the Zeno of Elea. A Greek philosopher and mathematician, Zeno of Elea (born c.495—died c.43.BC), was known for his paradoxes to prove that the 'real being' is unique and unchanging. There is 'the one', indivisible reality. More or less during the same period Buddhism has enunciated similar view, however much later, it was illuminated to eternal heights by Samkara (the Adi Shankara, born at Kaladi, Kerala in 788 AD and died in 820 AD at Kedarnath in the Himalayas). The Advaita Vedanta of Samkara espouses non-duality, which characterizes the Hindu ethos. There is one Atman, which is the basis of all, the only reality. These interpretations of reality confound with the mind-body duality which is our concern in this paper. Radhakrishnan, in his commentary on Samkara's Advaitavad refers to this ambiguity. He writes, "*The crux of all*

philosophy is this, that the sense-organs and the neural processes of the body, which is in space and time, seem to produce consciousness. Surely the non-conscious cannot be the cause of the conscious. If anything, the conscious must be the cause of the non-conscious." (Radhakrishnan, 1940/1997; p. 481)

However, Radhakrishnan (1940/1997) further clarifies that the Atman is the pure consciousness or fundamental consciousness, and basis of all reality. The body consciousness (Pirta, 2011b; Figure 3) is, however, different from this pure consciousness, and appeared rather late in the cosmic evolution. It is important for applied psychologists working in India, to comprehend the interaction between mind and body, on the one hand, and the distinction of the pure consciousness from body consciousness, on the other. Moreover, proponents of Indian Psychology adhere to assumptions of Indian schools of thought where all material manifestations are products of mind, or the pure consciousness (Cornelissen, 2011; Dalal, & Misra, 2010; Rao, 2001). Additionally, people in India have beliefs about various kinds of spirits (supernatural elements) that dynamically interact with each other and affect human thinking and behaviour (Carstairs, & Kapur, 1976; Kakar, 1982; Nandy, 1997).

Essentially the aim of applied psychology is to use the advances in the science of mind for understanding human mental processes and to modify human behavior and attitudes. In this attempt human brain and physiology are thought as mediating mechanisms and remains poorly understood by students of applied psychology. In view of this indifference, the report of World Health Organization on mental health in 2001made a significant attempt by highlighting the advances in the brain science, on the one hand, and parallel developments in cognitive science, on the other hand (WHO, 2001). These advances additionally support the resolution of the World Health Organization to underline the mutuality of mind and body for understanding mental health. However, this most enlightening message of the report went unnoticed by the mental health professionals. The mutuality of mind and body, as noted above, has fundamental significance for applied psychology, in theory as well as practice. The issue is, does mind change brain (neuroplastic mechanism) and in turn behavior? And, conversely, does behavior change brain (feedback mechanism) and in turn mind.

The present paper has two sections. The first section reviews evidence for the mutuality of mind and body, which has a basis in quantum theory. The second section reviews evidence from the research conducted over a past decade or so that further strengthens the mutuality of mind and body (brain), especially in the context of the role of supernatural elements in human well-being.

A new paradigm in psychology

Psychologists still follow the paradigm of classical physics where the agent is passive. For a quantum physicist the agent is active, having free will or intentionality, and psychologists must follow this dictum. In view of quantum physicist Sudarshan (1982), '*mind is an interface between the public world described by the physical sciences and the private world of personal experience and individuality*.' In this case the task of psychologist is to understand the latter part, *experiences of the being*, whereas the quantum physicist would help him to describe mind in terms of '*physic-chemical laws'*. These laws may not be the ones through which we have been understanding the physical world or reality, on which the method of science stands. In the eyes of quantum physicist the properties of agent as equipment and the properties of agent as an object of

experimentation, both have significance. True as it may be, in a new framework the psychodynamic psychotherapist explores *mind as an assemblage of associative networks* (Shedler, 2006), similar to computer scientists, one however needs to observe cautiousness since his dialogues with the patients are extremely fluid. The new paradigm articulated in this paper does not have this weakness as it rests on the plasticity and indeterminate nature of material particles constituting brain.

A quick look at neuropsychology is essential here as it has emerged an important applied area in psychology. But more significantly, the mental phenomena were subjected to rigorous enquiry under the leadership of D. O. Hebb, which provided sound basis for a neuropsychological theory. For him, *a stream of thought* was the product of phase sequence, activity in groups of various cell assemblies, whereas the stimulation of a group of neurons forming a cell assembly could be the equivalent of an *idea* or *image* (Hebb, 1959; Brown, & Milner, 2003). Later, Luria (1970) defined neuropsychology as the study of the effects of brain processes on mental processes, and in Indian context, his work provides theoretical basis for cognitive planning (Das, Kar, & Parrila, 1996), and development of neuropsychological battery (Gupta et al. 2000). The essential feature of the neuropsychological approach is to explore how brain processes leads to mental processes (Wennekers, Sommer, & Aertsen, 2003), in cultural context (Bailey, Giustetto, Huang, Hawkins, & Kandel, 2000; Kotik-Friedgut, 2006).

A greater challenge awaiting psychology is how mind changes brain, a cornerstone of psychotherapy. In psychoanalysis, brain is essentially a nonentity and the underlying mental processes are sufficient to account for mental outcomes. But the need for change in this mindset has been underlined by neurologists (Kandel, 1999), and the psychodynamic therapies now share many of their premises with cognitive psychology (Shedler, 2010; Westen, 2006). Therefore the hypothesis that one can discard brain from the paradigm of psychology is untenable. Moreover, such paradigm flouts the material assumption. By including brain in the paradigm the material assumption is not defied. It does not matter whether one chooses to understand the effect of 'mind on brain' or 'brain on mind', alternatively brain is simply an intervening variable. We already have evidence on the effect of brain on mind from neuropsychology, it is indeed important to note that knowledge about the effects of mental processes on measurable changes in the brain processes is accumulating from applied areas of psychology (Beauregard, 2007; Beauregard, & Paquette, 2006; Paquette, Le´vesque, Mensour, Leroux, Beaudoin, Bourgouin, & Beauregard, 2003).

A significant issue is to conceptualize the nature of changes in the physical-chemical particles that constitute brain, and its interaction with the mind as an input and output system (Pirta, 2011b; Figure 1). Consider, for example, the psychological processes such as focusing of attention and mental effort (Kahneman, 1973; 2002), and the measurement of well-being and happiness (Kahneman, Kruger, Schkade, Schwarz, & Stone, 2006). It will be hard to refute the mediation of physical-chemical particles, constituting brain, in these processes. According to quantum physicist Sudarshan, the physical-chemical interactions of these particles are highly dynamic, it hardly matter whether we see them at molecular level or molar level. It is the experimenter's interest where (in space) and when (in time), he wants to look at them (Sudarshan, 1981; 2002). Secondly, whether his emphasis is on physical/biological, mental/cultural, or divine realm, does not matter. Since the space and time in 'mind-brain-mind' interactions are so

dynamic that the available classical physical equipment (third-person approaches) or human equipment (first-person approaches) is not able to grasp it, as is the case with cognitive illusions (Kahneman, 2002; Velmans, 2007).

A similar phenomenon may have occurred when particle physicists, following highly reductionist approach, met an impasse of time and space. The experiment to reduce matter into smaller and smaller particles, or quest to see the smallest unit of the matter (the reality stuff) was unsuccessful, instead a strange reversal, from the part to whole, took place in the investigator's cognition. Now the investigator began to conceptualize the reality, the smallest unit of matter (Sudarshan, 1995). Instead of showing the reality directly by experimentation, they began writing equations of the probability of the reality stuff, the quantum, which was unstable in time and space. These conceptualizations about non-existing particles have been though quite successful in the prediction of certain natural phenomena. So the quest of *rishis* such as Sudarshan (1982; 1983) is continuing in lonely rooms (like the hermits in the caves of the Himalayas). They have questioned the classical theories about matter (or reality) in their discipline. These theories of the reality of matter, termed now as classical physics, have lost validity.

It is therefore time to replace the stimulus-response paradigm by a new holistic paradigm—**mind-brain-mind**. In a paper, Pirta (2004) wrote that there was possibility that '*quantum physics changes our vision of mental phenomena*.' It was based on the statement of Sudarshan made in a general article '*The promise of quantum computing*' (Sudarshan, 2003). However, Schwartz et al. (2005) in an exhaustive analysis conclude that quantum physics has importance for a study of mind-brain link, and underline quantum Zeno effect as the key concept. The Zeno effect came into prominence in a paper of Misra and Sudarshan (1977), and is conventionally defined as the '*effortfully controlled intentional action*.' In other words, a person consciously or actively controls certain intended mental activities, which in turn influence brain. Experimental psychologists have shown importance of mental effort in cognitive functions (Kahneman, 1973) and on the other hand, intentionality is a central problem in neuropsychology. Recent studies suggest that mirror neurons play significant role in this process and this theorization has immense significance for psychotherapy especially in the area of autism (Ramachandran, 2010; Rizzolatti, Fogassi, & Gallese, 2006).

There are a number of therapeutic studies, which attempts to understand the mind-brain interaction borrowing principles from quantum physics, and underline the phrase *change the mind and you change the brain* (Paquette et al. 2003; Schwartz et al. 2005). The joint work of these scientists from different fields has brought convincing evidence that *mind does really matter* (Beauregard, 2007). This new work has great promise for treatment and practice in clinical psychology. Although a clinical psychologist need not describe the changes taking place in brain during the course of psychotherapy (Kazdin, 2008), the important thing is *not* to overlook the dynamic interaction of mind and brain. Consider the case of a therapist. The therapy is definitely the causal factor in the chain of events, but it is not beyond therapist's professional domain to study the mediation of brain between therapy and outcome (Paquette et al. 2003).

Since neurologists were likely to face an impasse, like the quantum physicists, at the molecular level, it occurred to a brain scientist R. W. Sperry that there may be a downward control where our higher mental processes becomes an intrinsic force and thus assume causal properties. In this new paradigm, the macrolevel mental phenomena such as

beliefs and values cause material changes crucial for human affairs. In this macromental paradigm for psychology, the subjective belief "*is no longer a mere impotent epiphenomenon of brain activity*" but also "*a shaper of both individual and social behavior*." (Sperry, 1991) And the most important beliefs are about life's purpose and meaning, and about God and the cosmic scheme. An important objective of macromental outlook where mind-brain forms an integrated whole is to take ultimate beliefs out of supernatural uncertainties into a realm consistent with science (Sperry, 1992). Such beliefs about the supernatural elements in human mind have significant role in mediating the development, transcription and actualization of scripts that influence our life (Pirta, 2011).

Supernatural Agents in Human Cognition

In a pioneering psychiatric study of a village in India, Carstairs and Kapur (1976) conclude that in India, on the one hand, the villagers were loyal to their traditional healers who invoke supernatural elements, but at the same time, they were not averse to new remedies of mental health. During the same period, Kakar made a radical departure from the prevailing ethos of psychology in exploring the life and ways of shamans and mystics in the vast cultural canvas of India (Kakar, 1982). Yet it appears to justify the universality of inaccessible ideas of Freud, a task further taken up by other scholars, for example, Davar and Bhatt (1995). Even today, questions of fundamental relevance for psychology related to the origins of sacred beliefs are alien to psychologists in India (Dalal, & Misra, 2010; Kakar, 2009). One such question is implicit in these words of a noted historian of India, '*the assumed presence of deity converted the temple into a sacred space where a relationship between the deity and the devotee could be sought*.' (Thapar, 2002; p. 387) While she explored the development of temple as an institution from various aspects, it is for psychologists to understand the sacred relationship between the temple and its devotees.

On similar lines a quantum physicist delving into the nature of matter reminds us that structuralism and functionalism are fundamental to evolution of mind (Sudarshan, 1995). The mind-brain-mind paradigm has implications for exploring the dynamics of supernatural agents in human cognition. These agents, residing in human cognition and culture, include deities, souls, spirits, ghosts and others (Bering, 2006; Boyer, 2003). In this final section we look into the structural apparatus, and the functional aspects of human mind where these supernatural elements originate and dynamically affect our well-being.

Structural aspects: Psychology is essentially concerned with mental processes, as Hebb (1959) categorically stated while laying down the structure of neuropsychology in neural connections. The mind-brain-mind paradigm assumes that the investigator arranges experimental conditions to make the representation of specific events in the mind-brain complex. Once it has occurred, it is only then that mind-brain-mind interactions take place and the inquiry of a psychologist begins. Whereas imagery, schemata, and scripts are the ways of organizing our experiences, supernatural elements may enrich them. The dynamic interactions of mind-brain-mind implicate consciousness. Therefore we further assume that the live mind-brain complex is an essential structure for the manifestation of various forms of consciousness (Ramachandran, 2010; Sivananda, 1988), but its origin is not dependent upon the mind-brain complex (Crick, Koch, Kreiman, & Fried, 2004; Eccles, 1980; Koch, & Greenfield, 2007; Tsien, 2007). Table 1 contains the essential features of this mind-brain complex for cognitive supernatural agents.

Table 1. Features of mind-brain complex in cognitive system.

SNo.	Features
1.	A psychologically meaningful configuration of physical energies, after representation in the mind-brain complex takes an entirely different form (psychological here refers to the subject matter of psychologists, it may overlap with other disciplines). It is coded as a unique pattern of electrical, chemical and physiological properties (Tsien, 2007) and is then capable of generating thoughts, feelings, emotions, desires and all other kinds of psychological material, the mind stuff.
2.	The object of the mind-brain complex can be manipulated in numerous ways to achieve various ends. Such variety and complexity in manipulation of objects is not possible outside the mind-brain complex (Crick, Koch, Kreiman, & Fried, 2004; Sivananda, 1988, 2002).
3.	The mind-brain complex invents concepts and symbols intrinsically as well. This is obvious from the diversity of thoughts, feelings and desires. The mental elements, which arise without external material interaction, also undergoes through the preceding two processes (Faw, 2006).
4.	Thus material and non-material entities acquire similar properties in our mind-brain complex. This issue has been explored in context of social and physical pain (MacDonald, & Leary, 2005; Panksepp, 2003).
5.	An entity, such as supernatural element, can be encoded in the live mind-brain complex only, and once encoded it acquires material existence (Greenfield & Collins, 2005).
6.	The social institution acts as a facilitator or inhibitor of supernatural elements in particular cognitive systems within the individual (Pirta, 2005, 2006, 2007).
7.	The social institutions, however, facilitate the growth of certain class of entities, and inhibit others through “cultural selection,” a process analogous to “natural selection” (Crook, 1995, 2009).
8.	The individual is not fully aware of the dynamic interactions into which supernatural elements enter, from one moment to the next, they may conscious or unconscious (Greenfield, 2002; Kandel, 1999; Kahneman, 2002).
9.	The propagation of culture specific ideas related to supernatural elements enrich varieties of consciousness in the mind-brain complex (Faw, 2006; Norenzayan & Hansen, 2006).
10.	The mind-brain complex act as crucible where exceptional varieties of consciousness flourish; it is evident all over the world in current trends of religion and spiritualism (Armstrong, 2009; Crook, 2009).

Functional aspects: In applied psychology we need to embrace multidisciplinary approach as our subjects are embedded in the socio-cultural milieu. A few examples from allied disciplines are here. A unique achievement of human cognition is the invention of supernatural elements having its origin in the shamanistic ceremonies in caves some 30,000 years ago (Armstrong, 2009; Fisher, 1982; Winkelman, 2004). But the process did not stop there. The supernatural elements reside inside and outside the individual, and thus exert two-way control on thinking, feeling and behavior to mould one’s affectionate and sensual relationships (Faw, 2006; Jones, 2009).

Consider the analysis of Indian myths by a historian Kosambi (1975), where one finds explanatory models ranging from the ancient Vedic traditions to Marxist theory to the arena of psychoanalysis. A biologist, Gadgil (2001) found relevance of sacred terrain for the preservation of flora and fauna. The idea of *deo ban* or sacred grove has now been accepted as a part of policy by the concerned agencies. Earlier, in a remarkable statement, Wilson (1978) observed that several well-known advocates of humanism have either rejected religious belief as animism or else recommended that it be sequestered in some gentle preserve of the mind. According to this well known socio-biologist deeper explorations in traditional religious ethos have potential of refining the ‘*the evolutionary epic*.’ In this lies the promise of revealing unknown facets of human nature. To achieve this goal without flouting the material hypothesis of science the assumption is that there is

preprogramming of religious belief (Crook, 1995; 2009), the latter constitute the environment in which supernatural elements flourish.

A survey of literature suggests that there are at least ten contemporary hypotheses (Table 2) to answer the question, why do people believe in supernatural agents? Although involvement of mind-brain continuum varies in these explanations, the conceptualization of supernatural entities as elements of cognition is a unifying theme. Given that the belief in a supernatural agent selectively benefits a person, over time such believers are likely to increase. Not only the belief gets culturally propagated, the biological parameters of the population do change. Therefore it is important to explore the *proximate* and *ultimate* functions of beliefs in supernatural agents at the individual and the group level. The deities of little tradition in India have enormous variety of supernatural agents, and are focus of exploration in the Himalayan state known as Himachal Pradesh. Our observations (Pirta, 2005) on the institution of deity in villages show linkages between supernatural elements and coherence in social structure. Case studies (Pirta, 2006) at various group levels highlight role of supernatural elements in resolution of social conflicts, and involve explicit and implicit memory systems having implications in mental health. Lastly, the study of transhumance (Pirta, 2007; 2009) opens a complex dynamics of supernatural elements across the verticality of the Himalayas, which is the abode of sacredness (Pirta, 2011a).

Whether there is God, or not, the real problem is the origin of human belief in supernatural agents. A change is discernable from James (1902) to Crook (2009), there is vigorous interest among scientists to explore religious experiences. Thinkers from various disciplines are looking into the functional—

Table 2. Explanations of beliefs in supernatural agents.

SNo. Explanations	Proximate causation	Ultimate causation	Neuralmechanism	Theoretical Variable	Sub-area
1 Well-being enhancer (Armstrong, 2009; Chattopadhyay, 2009; Metzinger, 2005)	Yes	Yes	Yes	Many	Mental health
2 Compensatory mechanism (Kay, Gaucher, Napier, Callan, & Laurin, 2008)	Yes	No	No	One	Social psychology
3 Uncertainty reduction (Inzlet, McGregor, Hirsh, & Nash, 2009)	Yes	No	Yes	One	Social psychology
4 Terror management (Pyszczynski, Greenberg, & Solomon, 2007)	Yes	No	?	One	Social psychology
5 Dissonance reduction (Burris, Harmon-Jones, & Tarpley, 1997)	Yes	Yes	Yes	One	Socialpsychology
6 Sustainability facilitator (Goldsmith, 2001; Kazdin, 2009; Pirta, 2007; 2011)	Yes	Yes	No	Many	Environment
7 Perceived control (Crook, 1995; Gazzaniga, 1994)	No	Yes	Yes	One	Evolutionary psychology
8 Moralizing agent (Johnson, & Bering, 2006; Shariff, Cohen, & Norenzayan, 2009)	No	Yes	Yes	One	Evolutionary psychology
9 Credibility enhancing (Henrich, 2009)	No	Yes	Yes	One	Evolutionary psychology
10 Attachment objects (Granquist, Ljumgdahl, & Dickei, 2007)	No	Yes	Yes	One	Ethology

Darwinian and non-Darwinian—aspects of supernatural agents (Bering, 2006; Boyer, 2003; Dawkins, 2006; Jeeves, 2005; Metzinger, 2005; Norenzayan, & Hansen, 2006; Petrus, 2006). In addition, an important aspect being explored is the role of institution of deity to keep cohesion in a group (Boyd, Gintis, Bowles, & Richerson, 2003; Nowak, 2006; Shariff, & Norenzayan, 2007). Irrespective of the origin of a belief in a supernatural agent at a particular time in history, once these cognitions get representation in mind, they affect feeling, thinking and behaviour of individual, and his interactions and relationships in a social network begin to change and have consequences on well-being (Broota, 1997; Horan, 2009; Price, & Gardner, 2009; Purzycki, & Sosis, 2011; Sahdra et al. 2011; Sax, 2009; Travis, & Shear, 2010). These cognitions undergo replication, selection and retention and evolve culturally in a group (Schloss, & Murray, 2011).

Conclusion

The mind-body issue became more conspicuous as scientists began exploring the universal and yet highly elusive phenomenon of human consciousness. The way we have been thinking about matter on the basis of classical physics varies with new understanding given by quantum physics. In their quest the quantum physicists wondered into a world of mental abstraction, using the language of mathematics, and found extremely fascinating phenomena.

These *rishis* of modern science are abstracting information about discrete particles of matter that challenges human imagination. It has become clear now that the properties of matter with which we were familiar, along with the methods of measurement, require a radical change. In brief 'the reality' is *not* real. The behaviour of the discrete or quantum particles blurs the difference between material and non-material as both are products of 'one' only. There is possibility of such quantum changes occurring inside human brain, where, on the one hand, consciousness (awareness) arises, and, on the other hand, this consciousness modifies brain. These are highly subjective experiences, especially those related to supernatural elements affecting human well-being. In the first part of this paper, evidence was presented on the mutuality of mind and body, which has strong basis in quantum theory. In the second part research conducted over the past decade was reviewed that further strengthens the mutuality of mind and body (brain), especially in context of the role of supernatural elements in human well-being.

References

Armstrong, K. (2009). *The case for God: What religion really means*. London: The Bodley Head.

Bailey, C. G., Giustetto, M., Huang, Y-Y., Hawkins, R. D., & Kandel, E. R. (2000). The heterosynaptic modulation essential for stabilizing Hebbian plasticity and memory. *Nature Reviews Neuroscience*, *1*, 11-20.

Beauregard, M. (2007). Mind does really matter: Evidence from neuroimaging studies of emotional self-regulation, psychotherapy, and placebo effect. *Progress in Neurobiology*, *81*, 218–236.

Beauregard, M., & Paquette, V. (2006). Neural correlates of a mystical experience in Carmelite nuns. *Neuroscience Letters*, *405*, 186–190.

Bering, J. M. (2006). The folk psychology of souls. *Behavioural and Brain Sciences*, *29*, 453-498.

Blanton, H., & Jaccard, J. (2009). Arbitrary metrics in psychology. *American Psychologist*, *61*, 27-41.

Boyer, P. (2003). Religious thought and behaviour as by-products of brain function. *Trends in Cognitive Sciences*, *7*, 119-124.

Boyd, R., Gintis, H., Bowles, S., & Richerson, P. J. (2003). The evolution of altruistic punishment. *Proceedings of National Academy of Sciences USA*, *100*, 3531-3535.

Broota, K. D. (1997). Beliefs and their functional

significance. *Trends in Social Science Research*, *4*, 133-139.

Brown, R. E., & Milner, P. M. (2003). The legacy of Donald O. Hebb: more than the Hebb synapse. *Nature Reviews Neuroscience*, *4*, 1013-1019.

Burris, C. T., Harmon-Jones, E., & Tarpley, W. R. (1997). "By faith alone": Religious agitation and cognitive dissonance. *Basic and Applied Social Psychology*, *19*, 17-31.

Carstairs, G. M., & Kapur, R. L. (1976). *The great universe of Kota: Stress, change and mental disorder in an Indian village*. London: Hogarth.

Chattopadhay, S. (2009). Religion, spirituality, health and medicine: Why should Indian physicians care? *Journal of Postgraduate Medicine*, *53*, 262-266.

Cornelissen, M. (2011). Beyond the mask: An exploration of human identity based on the work of Sri Aurobindo. In G. Misra (Ed.), Handbook of psychology in India (pp. 139-148). New Delhi: Oxford University Press.

Crick, F., Koch, C., Kreiman, G., & Fried, I. (2004). Consciousness and neurosurgery. *Neurosurgery*, *55*, 273-282.

Crook, J. H. (1995). Psychological processes in cultural and genetic coevolution. In E. Jones and V. Reynolds (Eds.), *Survival and religion: Biological evolution and cultural change* (pp. 45-110). London: John Wiley & Sons.

Crook, J. H. (2009). *World crisis and Buddhist humanism. End games: Collapse or renewal of civilization*. New Delhi: New Age Books.

Dalal, A. K. & Misra, G. (2010). The core and context of Indian psychology. *Psychology and Developing Societies*, *22*, 121-155.

Das, J.P., Kar, B.C., & Parrila, R.K. (1996). *Cognitive planning. The psychological basis of intelligent behavior*. New Delhi: Sage.

Davar, B. & Bhatt, R. P. (1995). *Psychoanalysis as a human science: Beyond fundamentalism*. New Delhi: Sage.

Dawkins, R. (2006). *The God delusion*. London: Bantam Press.

Eccles, J. C. (1980). *The Human Psyche.* Berlin: Springer Verlag.

Faw, H. W. (2006). In the image of God: Exploring links with cognitive psychology. *Perspectives on Science and Christian Faith, 58*, 310-314.

Fisher, H. E. (1982). *The sex contract: The Evolution of human behaviour*. London: Granada.

Gadgil, M. (2001). Ecological journeys: The science and politics of conservation in India. New Delhi: Permanent Black.

Gazzaniga, M. S. (1994). Nature's Mind. The biological roots of thinking, emotions, sexuality, language and intelligence. New York: Penguin Books.

Goldsmith, E. (2001). Religion at the millennium. *The Ecologist*, *80*, 4-8.

Granqvist, P., Ljumgdahl, C., & Dickei, J. R. (2007). God is nowhere, God is now here: Attachment activation, security of attachment, and God's perceived closeness among 5–7-year-old children from religious and non-religious home. *Attachment & Human Cognition*, *9*, 55-71.

Greenfield, S. A. (2002). Mind, brain and consciousness. *British Journal of Psychiatry*, *181*, 91-93.

Greenfield, S. A., & Collins, T. F. T. (2005). A neuroscientific approach to consciousness. In S. Laureys (Ed.), *Progress in brain research* (Vol.150; pp.11-23). London: Elsevier.

Gupta, S., Khandelwal, S. K., Tandon, P.N., Maheshwari, M.C., Mehta, V.S., Sundaram, K.R., Mahapatra, A.K.,& Jain, S. (2000). The development and standardisation of a comprehensive neuropsychological battery in Hindi (adult form). *Journal of Personality and Clinical Studies*, *16*, 75-109.

Hebb, D. O. (1959). A neuropsychological theory. In S. Koch (Ed.), *Psychology: A study of a science* (Volume 1; pp. 622-643). New York: McGraw-Hill Book Company.

Henrich, J. (2009). The evolution of costly displays, cooperation and religion: credibility enhancing displays and their implications for cultural evolution. *Evolution and Human Behavior*, *30*, 244-260.

Horan, R. (2009). The neuropsychological connection between creativity and meditation. *Creativity Research Journal*, *21*, 199-222.

Inzlicht, M., McGregor, I., Hirsh, J. B., & Nash, K. (2009). Neural markers of religious conviction. *Psychological Science*, *20*, 385-392.

James, W. C. (1902). *The varieties of religious experience: A study in human nature*. New York:The Modern Library.

Jeeves, M. (2005). Neuroscience, evolutionary psychology, and the image of God. *Perspectives on Science and Christian Faith*, *57*, 170-186.

Johnson, D. D. P., & Bering, J. (2006). Hand of God, mind of man: Punishment and cognition in the evolution of cooperation. *Evolutionary Psychology*, *4*, 219-233.

Jones, D. (2009). Human nature: The remix. *Nature, 457*, 780-783.

Kahneman, D. (1973). *Attention and effort*. New Jersey: Prentice-Hall.

Kahneman, D. (2002). Maps of bounded rationality: A perspective on intuitive judgment and choice. Nobel Prize Lecture, Dec. 8.

Kahneman, D., Krueger, A. B., Schkade, D., Schwarz, N., & Stone, A. A. (2006). Would you be happier if you were richer? A focusing illusion. *Science*, *312*, 1908-1910.

Kakar, S. (1982). *Shamans, mystics and doctors*. Delhi: Oxford University Press.

Kakar, S. (2009).The resurgence of imagination: Psychoanalysts can learn about empathy from Eastern traditions. *Harvard Divinity Bulletin*, *37*, 47-57.

Kandel, E. (1999). Biology and the future of psychoanalysis: A new intellectual framework for psychiatry revisited. *American Journal of Psychiatry*, *156*, 505-524.

Kay, A. C., Gaucher, D., Napier, J. L., Callan, M. J., & Laurin, K. (2008). God and the government: Testing a compensatory control mechanism for the support of external systems. *Journal of Personality and Social Psychology*, *95*, 18-35.

Kazdin, A. E. (2008). Evidence-based treatment and practice: New opportunities to bridge clinical research and practice, enhance the knowledge base, and improve patient care. *American Psychologist*, *63*, 146-159.

Kazdin, A. E. (2009). Psychological science's contribution to a sustainable environment. *American Psychologist*, *64*, 339-356.

Koch, C., & Greenfield, S. (2007). How does consciousness happen? *Scientific American*, October.

Kosambi, D. D. (1975). *The culture and civilization of ancient India: A historical outline*. Delhi: Vikas Publishing House.

Kotik-Friedgut, B. (2006). Development of the Lurian approach: A cultural neurolinguistic perspective. *Neuropsychology Review*, *16*, 43-52.

Luria, A. R. (1970). The functional organization of the brain. *Scientific American*, March.

MacDonald, G. & Leary, M. R. (2005). Why does social exclusion hurt? The relationship between social and physical pain. *Psychological Bulletin*, *131*, 202–223.

Metzinger, T. (2005). Out-of-body experiences as the origin of the concept of a "soul". *Mind and Matter*, *3*, 57-84.

Misra, B., & Sudarshan, E. C. G. (1977). The Zeno's paradox in quantum theory. *Journal of Mathematical Physics*, *18*, 756-763.

Nandy, A. (1997). Facing extermination: A report on the present state of the gods and goddesses in South Asia. *Manushi*, *99*, 5-19.

Norenzayan, A., & Hansen, I. G. 2006. Belief in supernatural agents in the face of death. *Personality and Social Psychology Bulletin*, *32*, 174-187.

Nowak, M. A. (2006). Five rules for the evolution of cooperation. *Science*, *314*, 1560-1563.

Panksepp, J. (2003). Feeling the Pain of Social Loss. *Science*, *302*, 237-239.

Paquette, V., Le´vesque, J., Mensour, B., Leroux, J.-M., Beaudoin, G., Bourgouin, P. & Beauregard, M. (2003). "Change the mind and you change the brain": effects of cognitive-behavioral therapy on the neural correlates of spider phobia. *NeuroImage, 18*, 401–409.

Petrus, T. S. (2006). Engaging the world of the supernatural: anthropology, phenomenology and the limitations of scientific rationalism in the study of the supernatural. *Indo-Pacific Journal of Phenomenology*, *6*, 1-12.

Pirta, R. S. (2004). Environmental implications of biological, cultural and humanistic pathways in evolution: Part I. Affectionate relationships in primates. *Psychological Studies*, *49*, 220-226.

Pirta, R. S. (2005). Community mental health approach in rural areas: Developing the

traditional institution. *Journal of Personality and Clinical Studies*, *21*, 91-108.

Pirta, R. S. (2006). Community-based approach to mental health: The traditional healing. *Journal of Community Guidance & Research*, *23*, 161-177.

Pirta, R. S. (2007). *Ecology and human well-being: Nature and society in Himachal Pradesh.* Delhi: Shipra Publications.

Pirta, R. S. (2009). *Pastoralism and the tribesman of mountain: the arung zet sa of Kanaor.* Delhi: Shipra Publications.

Pirta, R. S. (2011a). Indigenous approach to environmental psychology. In G. Misra (Ed.), *Hanbook of psychology in India* (pp. 313-326). New Delhi: Oxford University Press.

Pirta, R. S. (2011b). Methodological issues in psychological pursuits of Indian origin. *Journal of the Indian Academy of Applied Psychology*, *37*, 212-223.

Price, J. S., & Gardner, Jr., R. (2009). Does submission to a deity relieve depression? Illustrations from the book of Job and the Bhagvad Gita. *Philosophical Papers and Reviews*, *1*, 17-31.

Purzycki, B. G., & Sosis, R. (2011). Our Gods: variation in supernatural minds. In U. J. Frey et al. (eds.), *Essential building blocks of human nature* (pp. 77-93). Berlin: Springer-Verlag.

Pyszczynski, T., Greenberg, J., & Solomon, S. (2007). Proximal and distal defense: A new perspective on unconscious motivation. *Current Directions in Psychological Science*, *9*, 156-160.

Radhakrishnan, S. (1940/1997). *Indian philosophy. Volume II*. Delhi: Oxford.

Ramachandran, V. S. (2010). *The tell-tale brain: Unlocking the mystery of human nature*. Noida, U. P.: Random House India.

Raman, C. V. (1968). *The physiology of vision*. Bangalore: The Indian Academy of Sciences.

Rao, K. R. 2001. Consciousness studies: A survey of perspectives and research. In J. Pandey (ed.), *Psychology in India revisited—Developments in the discipline. Volume 2: Personality and health psychology* (pp.19-162). New Delhi: Sage.

Rizzolatti, G., Fogassi, L., & Gallese, V. (2006). In the mind. *Scientific American India*, November.

Sahdra, B. K. et al. (2011). Enhanced response inhibition during intensive meditation training predicts improvements in self-reported adaptive socioemotional functioning. *Emotion*, *11*, 299-312.

Sax, W. S. (2009). *God of justice: Ritual healing and social justice in the central Himalayas*. New York: Oxford.

Schloss, J. P., & Murray, M. J. (2011). Evolutionary accounts of belief in supernatural punishment: a critical review. *Religion, Brain & Behavior*, *1*, 46-99.

Schwartz, J.M., Stapp, H., & Beauregard, M., (2005). Quantum theory in neuroscience and psychology: a neurophysical model of mind/brain interaction. *Philosophical Transactions of the Royal Society B: Biological Sciences*, *360*, 1309–1327.

Shariff, A. F., Cohen, A. B., & Norenzayan, A. (2009). The devil's advocate: Secular arguments diminish both implicit and explicit religious belief. *Journal of Cognition and Culture*, *8*, 417-423.

Shariff, A. F., & Norenzayan, A. (2007). God is watching you: Priming God concepts concepts increases prosocial behavior in an anonymous economic game. *Psychological Science*, *18*, 803-809.

Shedler, J. (2006). That was then, this is now: Psychoanalytic psychotherapy for the rest of us. Retrieved from http://psychsystems. net/shedler.html

Shedler, J. (2010). The efficacy of psychodynamic psychotherapy. *American Psychologist*, *65*, 98-109.

Sivananda, S. (1988). *Thought-power*. Shivanandanagar: The Divine Life Society.

Sivananda, S. (2002). *Conquest of mind*. Shivanandanagar: The Divine Life Society.

Sperry, R. W. (1991). Search for beliefs to live by consistent with science. *Zygon*, *26*, 237-258.

Sperry, R. W. (1992). Paradigms of belief, theory and metatheory. *Zygon*, *27*, 245-259.

Sudarshan, E. C. G. (1981). Cohesion and physical structure. In H. Kellerman (Ed.),

Group cohesion (pp. 123-131). New York: Grune & Stratton.

Sudarshan, E. C. G. (1982). Evolution of mind. *Journal of Time, Space and Knowledge*, 5-30.

Sudarshan, E.C.G. (1983). Evolution of mind: Projections into the future. In K. Gandhi (Ed.), *The evolution of consciousness* (pp. 83-108). New Delhi: National Publishing House.

Sudarshan, E. C. G. (1995). Nature and function of matter. In J. V. Narlikar (Ed.), *Prakriti: The integral vision. Volume 4. The nature of matter* (pp. 21-28). New Delhi: D. K. Printworld.

Sudarshan, E. C. G. (2002). One quest, one knowledge. In W. M. Richardson, R. J. Russell, P. Clayton, and K. Wegter-McNelly (Eds.), *Science and the spiritual quest* (pp. 247-252). New York: Routledge.

Sudarshan, E. C. G. (2003). The promise of quantum computing. *Current Science*, *84*, 504-512.

Thapar, R. (2002). *Early India. From the origins to AD 1300*. New Delhi: Allen Lane; Penguin.

Travis, F., & Shear, J. (2010). Focused attention, open monitoring and automatic self-transcending: Categories to organize meditations from Vedic, Buddhist and Chinese traditions. *Consciousness and Cognition*, *19*, 1110-1118.

Tsien, J. Z. (2007). The memory code. *Scientific American*, *2*, 34-41.

Velmans, M. (2007). An epistemology for the study of consciousness. In M. Velmans & S. Schneider (eds.), *The Blackwell companion to consciousness* (pp. 711-725). New York: Blackwell.

Wennekers, T., Sommer, F., & Aertsen, A. (2003). Editorial: Cell assemblies. *Theory in Bioscience*, *122*, 1-4.

Westen, D. (2006). Implications of research in cognitive neuroscience for psychodynamic psychotherapy. *Focus*, *4*, 215-222.

WHO (World Health Organization) (2001). *The world health report: 2001: Mental health: New understanding, new hope*. Geneva: World Health Organization.

Wilson, E. O. (1978). *On human nature*. Cambridge, Massachusetts: Harvard University Press.

Winkelman, M. (2004). Shamanism as the original neurotheology. *Zygon*, *39*, 193-217.

Wiserman, R., Watt, C., Stevens, P., Greening, E., & O,Keeffe, C. (2003). An investigation into alleged 'hauntings'. *British Journal of Psychology*, *94*, 195-211.

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