Advaita Vedānta, the art and science of yoga, introspection, and the hard problem of consciousness

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The great ancient knowledge system of India known as Vedānta has several schools of thought and forms the rational philosophical system which is the foundation of Hinduism. It is based on various Upanishads178, the Brahma Sūtras, and the Bhagavad Gītā. It provides a profound science179 of the mind and consciousness which is relevant for contemporary westerns sciences like psychology, neuroscience, biology, and physics (Frawley, 2001; Silberstein, 2017; Vaidya & Bilimoria, 2015). Most Vedāntic schools of thought are dualistic in nature with the exception of Advaita Vedānta which is furthermore incompatible with superficial and naïve materialistic ideologies (e.g., naïve realism). Its introspective methods permit deep insights into the nature of the self (via systematic meditation and self-reflection) which are pivotal for the understanding of the nature of mind and consciousness which lies at the very heart of all sciences because ultimately all knowledge is in the mind (i.e., the primary instrument of science is the mind). Especially, the non-dualistic school of Advaita Vedānta is pertinent in the current context. Advaita (in Sanskrit180 also known as Puruṣavāda) literally means "not-two" (a = not, dvaita = two).181 Advaita Vedānta is not a beliefsystem but it is based on first-person phenomenological experiences which have been cross-validated countless times over many millennia and in different cultural contexts. Yoga, prāṇāyāma, philosophical inquiry, introscpective psychological analysis, a Sattvic vegetarian diet, meditation, purity in intention/thought/word/action, etc. are tools utilised to systematically purify and prepare body and mind in order to facilitate the experience of nondual consciousness, i.e., various forms of Samādhi , e.g., Savikalpa Samādhi (meditation with support of an object, I-am-ness), and ultimately Nirvikalpa Samādhi (nonconceptual pure awareness, complete absorption without self-consciousness). Recently, specific EEG (Electroencephalography) frequency band characteristics have been proposed in "an attempt to create taxonomies based on the constructs of contemporary cognitive sciences" (Josipovic, 2010, p. 1119). Moreover, an excellent article entitled "Neural correlates of nondual awareness in meditation" has been published in the "Annals of the New York Academy of Sciences" and discusses data which indicates the involvement of a precuneus182 network in

nondual awareness (Josipovic, 2014). Josipovic gives the following preliminary definition: "Dualities such as self versus other, good versus bad, and in-group versus out-group are pervasive features of human experience, structuring the majority of cognitive and affective processes. Yet, an entirely different way of experiencing, one in which such dualities are relaxed rather than fortified, is also available. It depends on recognizing, within the stream of our consciousness, the nondual awareness (NDA)–a background awareness that precedes conceptualization and intention and that can contextualize various perceptual, affective, or cognitive contents without fragmenting the field of experience into habitual dualities." (Josipovic, 2014, p. 9) Because most of westerns psychology is caught up in externalities due to the constant focus on an external locus of stimulation and sensation it is predominantly concerned with the limited personal self (the transactional self) in addition to various unconscious processes.183 Vedānta places great emphasis on introspection, contemplation, and meditation. In "the western world", the majority of psychologists have never engaged in systematic introspective mediation (Siegel, 2010) and are therefore unfortunately utterly unaware of the workings of their own mind (a defining characteristic of contemporary Western materialistic consumer societies). In a neuropsychological context the composite lexeme "mindsight" has been proposed to describe this discerning metacognitive process (Siegel, 2009, 2010). Currently, introspection is not part of the academic psychology curriculum even though it is indispensable for a genuine science of the mind (and beyond). Therefore, the vast majority of psychologists lack phenomenological access to the experience of unity consciousness184, an experiential phenomenon which has been documented across cultures and epochs (James 1842-1910, 1902). Due to a lack of phenomenological access, psychologists might even disregard transcendental states as mere phantasms or chimera. It can be cogently argued that psychologists (and scientists in general) should be trained in these self-reflective experiential techniques in order to better understand the workings of their own mind which would not only benefit their general mental health and well-being but would also enable them to explicitly address all kinds of irrational cognitive biases, motivations, desires, and delusions which would be extremely beneficial for the progress of science in general. Otherwise psychologists lack the most basic cognitive tools and will not understand185 their own mind and consciousness and will be in no position to appreciate the timeless profound contemplative traditions of many cultures. That is, nondogmatic (secular) meditation practices should be integrated into the psychology curriculum – in the same way personal psychoanalysis was crucial in the education of psychoanalysts in the last century for psychologists. We could provide extensive arguments for this recommendation, but we will abstain from doing so for reasons of parsimony and focus and refer to Daniel Siegel's book "Mindsight: The New Science of Personal Transformation" (Siegel, 2010) for an extensive discussion of the topic.186 Yoga and Vedānta emphasise the unity between the individual self (Brahman) and the universal supreme consciousness (Ātman/Jivātman /Purusha) which is thought to be manifested in all forms of life (the universal reality behind all of apparent existence). In other words, the manifestation of consciousness within each of us and the con-

sciousness which pervades the entire universe is identical and hence singular, a perspective which recently received much attention in the context of consciousness studies (Bayne & Chalmers, 2012; D Chalmers, 2015, 2016; Vaidya & Bilimoria, 2015). Advaita Vedānta is a sophisticated philosophy that demands self-examination and self-reflection (via yogic practices like asana187 and mediation188), that is, the contents of the mind and the ego construct are carefully investigated in a scientific and rational manner leading to self-knowledge (atma jñāna189) and self-realisation (cf. Maslow, 1968). The famous "Tat Tvam Asi" (Thou art that) is one of the Mahāvākyas (grand pronouncements) of Vedāntic Sanātana Dharma (eternal laws). It originated from the Chandogya Upanishad, one of the oldest Upanishads which is estimated to be composed in the early 1st millennium BCE (Olivelle, 1998). In Buddhism (which is an offshoot of Hinduism), jñāna refers to pure (conceptual) awareness. In the spiritual practice of Advaita Vedānta, mental contents are subjected to systematic introspective observation. This leads to a dissociation (detachment) from the contents of thought (the observer is independent from the contents of the mind – as exemplified by the mantra "I am not the body, I am not the mind)" which is used to induce an altered state of consciousness (yoga190) (cf. Tart, 1972, 2008). This intense metacognitive activity fosters a deeper understanding of self and the relation between the self and the universe. The silencing of the mind can occasion a profoundly transformative unity experience (Samādhi) which unifies the individual consciousness with the universal consciousness. This intellectual heritage of India is very important for contemporary western science and it needs to be integrated into our knowledge system (a truly interdisciplinary and cross-cultural endeavour). Besides its significant theoretical contributions to the corpus of human knowledge, this complex knowledge system has far reaching moral and ethical implications (Nirban, 2018) due to the emphasis of the unity of all living beings191 – a holistic/organismic perspective which is antagonistic with the individualism of western societies (Hofstede, 2001). "The goal of Advaita Vedānta is to show the ultimate non-reality of all distinctions; reality is not constituted of parts." (Gupta, 1998, p. 1) Advaita Vedānta is relevant in the context of "the hard problem of consciousness" (D. J. Chalmers, 1995; David Chalmers, 2007; John R. Searle, 1998; C. U. M. Smith, 2009). Neuroscience is currently unable to account for consciousness and "the generation problem of consciousness" looms large192. At the same time the role of observation is an unsolved puzzle in quantum physics. There appears to be some convergence between neuroscience, psychology, and physics on the topic of consciousness. However, science is currently not in a position to articulate what this convergence exactly entails. The relationship between the observer and the observed seems to play a central role in this context as indicated by "the measurement problem" in quantum physics (Hollowood, 2016; Schlosshauer, 2004).

Footnotes

178 The Upanishads are the portion of the Vedas (Veda meaning knowledge) which primarily deals with knowledge of the self. Many core principles of the Upanishads are shared with Buddhism. 179 The Advaita Vedānta terminology might easily put off those with a certain Western analytic bias (i.e., those who are biased and prejudiced towards materialism), as has been pointed out by Silbestein (2017, p. 1139). However, we urge those readers to supress their (enteric) gut-reaction and aknowledge the antiquity and pertinence of this school of thought for the contemporary debate of consciousness and psychophysics. Hence our entreaty for nondogmatism and openmindendness formulated in the introduction of this thesis. 180 Sanskrit does not only refer to a language but to an ancient culture with a prehistory of more than 5000 years and it spread across a vast territory of Asia over a period of circa 2000 years (Bhate, 2010). 181 While the English language is very capable of describing material aspect of reality Sanskrit has a vast vocabulary for psychological processes, a fact which is interesting from acognitive linguistics perspective (i.e., linguistic relativism a la Sapir-Whorf (Sapir, 1929)). 182 The precuneus is „the functional core of the default-mode network“ (Utevsky, Smith, & Huettel, 2014) which is activated when an individual is not focused on the external physical world (i.e., extrospection). The precuneus is part of the superior parietal lobule which is anatomically located anterior of the occipital lobe. Interestingly, a recent fMRI study demonstrated a drecrease in functional connectivity within the precuneus after Ayahuasca intake (Palhano-Fontes et al., 2015). Ayahuasca is a phytochemical concoction which has been used by indegenous people in the Amazonian rainforests for unknown times. It combines N,N-Dimethyltryptamine (DMT, which is structurally very closely related to serotonin) with a monoamine oxidse inhibitor to prevent th enzymatic breakdonw of DMT within the gastro-intestinal tract. Ayahusaca (and DMT in its pure chrystaline form) can occasion nondual experiences (but see 0 and 0). Based on the concgruence of these unconected empirical findings we propose the experimentally testable hypothesis that nondual states induced by serotonergic psychedelics (especially 5-HT2A agonsists) and those faciliatted by various mediatation techniques share similar underlying neural correlates. Such a convergence would establish the common neural basis of nondual awarenss induced by completly difefrent methods which evolved in different socio-cultural contexts. 183 Freudian psychoanalysis mainly focuses on the unconscious aspects of the mind (the mind is not identical to consciousness – this crucial distinction is often confused) but Freud was unaware of the higher aspects of universal consciousness and self-realisation. The mind is thus mainly defined in social and physical terms. Jung extended the Freudian model and focused on the collective unconscious and its archetypal contents. However, both are currently not accepted in mainstream academic discourse, i.e., their complex theories are not part of the majority of psychology curricula and are often superficially dismissed as pseudoscience (Popper, 1959, 1962). 184 Charles Tart pointed out in his SCIENCE article “States of Consciousness and State-Specific Sciences” that altered states of consciousness (ASCs) resemble a Kuhnian paradigm: “The conflict now existing between those who have experienced certain ASC’s (whose ranks include many young scientists) and those who

have not is very much a paradigmatic conflict [...] A recognition of the unreality of the detached observer in the psychological sciences is becoming widespread, under the topics of experimenter bias (8) and demand characteristics (9). A similar recognition long ago occurred in physics when it was realized that the observed was altered by the process of observation at subatomic levels. When we deal with ASC's where the observer is the experiencer of the ASC, this factor is of paramount importance." (Tart, 1972, p. 1205) However, the term "altered states of consciousness" is not the best choice because it can be persuasively argued that consciousness is unchangeable, what changes is the mind. Therefore, a better term would be "altered states of mind". 185 The analogy of a neurologist who has never seen a brain lags behind because neuroanatomical knowledge can in principle be acquired through other sources of knowledge (e.g., books, lectures, videos, computer simulations, etc.) The symbol grounding problem as illustrated by John Searle in his "Chinese room argument" is perhaps more appropriate because what is lacking is understanding or first-hand experiential grounding (J. R. Searle, 1982). This relates to Aldous Huxley's criticism of the purely abstract and symbolic nature of education (Huxley, 1989) which neglects psychosomatic and phenomenological aspects. We will come back to this point in the context of recent empirical findings in the field of embodied (Lakoff, 1987) and grounded cognition (Barsalou, 2008). 186 Abraham Maslow argues in his book "The Psychology of Science" that "there is no substitute for experience, none at all. All the other paraphernalia of communication and of knowledge – words, labels, concepts, symbols, theories, formulas, sciences — all are useful only because people already know experientially. Interestingly, he refers to Niels Bohr and the complementarity principle in this context: "This world of experience can be described with two languages, a subjective, phenomenological one and an objective, "naïvely realistic" one, as Niels Bohr pointed out long ago. Each one can be close to the language of everyday life, and yet neither describes life completely. Each has its uses and both are necessary." (Maslow, 1962, p. 29) 187 The physical practice of asana is particularly interesting from an embodied cognition point of view. Embodied cognition (Lakoff, 2014) and grounded cognition (Barsalou, 2008) argue for the bodily basis of thought. That is, abstract thought is inherently cross-modal and rooted in the sensorimotor systems of the brain (rather than being amodal and purely symbolic). Therefore, asana can be viewed as a systematic enlargement of the sensorimotor repertoire, thereby providing the neural basis for novel forms of abstract thought. Following this argumentative line, asana can thus be regarded as a technique for cognitive development. Aldous Huxley provided the following remarkable quote by Baruch de Spinoza (who can be regarded as a dual-aspect monists): "Teach the body to become capable of many things. In this way you will perfect the mind and permit it to come to the intellectual love of God." Huxley present this quote in his lecture "Realizing human potentials" (Huxley, 1989) as part of his important argument that education places too much emphasis on symbolic (e.g., verbal/mathematical) activity while it neglect the intimate relation between body and mind. This is now empirically supported by a vast array of neuroscientific and psychological studies which were conducted in the framework of

embodied cognition which is also of great importance for the field of AI (but see M. Anderson, 2003). The non-dual science/art of yoga, on the other hand, always placed great importance on the integrative relationship between mind and body (cf. the perennial mind-body problem (Blanke & Thut, 2012; Damasio, 2000; Daniels, 1976; Feyerabend, 1963; Fodor, 1981; Hoffman, 2008; Wimsatt, 1976)). 188 The Sanskrit term is dhyāna, and it can be translated as "to think, to contemplate, to ponder" even though the penultimate goal of meditation is to transcend conceptual though i.e., Nirvikalpa samādhi, a non-conceptual state of absorption without self-awareness in which the dichotomy between the observer and the observed (the seer and the seen) dissolves. The contemporary analogue in psychology and neuroscience might be "ego-dissolution" (Millière, 2017). Interestingly, cutting-edge neuroscientific evidence (using various sophisticated neuroimaging techniques like fMRI and arterial spin labelling) indicates that ego-dissolution can be occasioned by certain naturally occurring (and sometimes endogenous) neurotransmitter like substances which bind primarily to the 5-HT2A receptor subtype (Carhart-Harris, Muthukumaraswamy, et al., 2016b; Lebedev et al., 2015; Nour et al., 2016a). For the first time in the history of humanity, science is thus in a position to experimentally induce non-dual states of consciousness in a repeatable and rigorously controlled fashion. These neurochemical tools (especially the tryptaminergic psychedelics) are therefore of great importance for our understanding of psychophysics and consciousness in general. The more general importance of this paradigm-shift in consciousness will be discussed subsequently. 189 The root of the Sanskrit term jñāna which is pronounced as /dʒəˈnɑː.nə/ (IPA, International Phonetic Association, 1999) is an etymological cognate to the English term "knowledge", as well as to the Greek γνώ (as in gnosis γνῶσις). 190 Yoga literally means "to join" or "to unite" and it forms the basis for the English term union/unity. In Vedānta, the term yoga implies the union between Atman and Brahman (i.e., the individual self unites with universal consciousness – a profound and transformative non-dual experience which has been described in many cross-cultural contexts (Bayne & Chalmers, 2012; Elder, 1980; James 1842-1910, 1902; Raymont & Brook, 2009). 191 For instance, the cardinal virtue ahiṃsā (nonviolence, or more specifically, harmlessness) is integral the Vedantic tradition. Historically, our respect for animals increased over time. For instance, Descartes believed that animals are merely machines and that only humans possess a soul. We argue that our respect for other living creatures grows diachronically in proportion to the evolution of human consciousness. To quote the great author Leo Tolstoy: "As long as there are slaughter houses there will always be battlefields." That is, as long as we are able to harm animals we are also capable of inflicting harm on other human beings (the differences between these species are not that big from a biological/genetic point of view (Orr, Masly, & Presgraves, 2004)). In sum, our ethical behaviour is closely linked to our philosophical Weltanschauung and non-dualism automatically fosters ethical virtues because it emphasises the organismic interconnectivity of nature (e.g., nature as a superorganism – a complex system perspective on all of life (Rosenberg & Zilber-Rosenberg, 2011)). 192 The hitherto unsolved „hard problem" is: How is consciousness generated

from matter? As Thomas Henry Huxley put it: “How it is that anything so remarkable as a state of consciousness comes about as a result of irritating nervous tissue, is just as unaccountable as the appearance of the djinn when Aladdin rubbed his lamp in the story.” According to the philosophical position of „new mysterianism“ the hard problem of consciousness can in principle not be resolved by human beings, i.e., it is „a mystery that human intelligence will never unravel“ (McGinn, 2004). That is, human cognisers posses inherent epistemological limitations which prevent them to solve the quintessential and perenial mind-matter problem (in the same way an ant cannot know molecular genetetics due to its species-specific limitations).