ABSTRACT: Generally speaking, human life is characterized by an array of experiences, which, both in health and disease, can have a spiritual/religious dimension. In the last decades, spirituality/religiosity has attracted a huge body of research and neurotheology or spiritual neuroscience is emerging as a modern multidisciplinary field aimed at understanding religious experiences and practices, as well its impact on well-being, with a focus on mental health, and its potential therapeutic implications in the treatment of neuropsychiatric disorders. For this purpose, neurotheology combines a variety of approaches and theoretical frameworks, deriving influences from theology, divinities and religious studies, philosophy, sociology, cognitive science, neuroscience, psychology, and anthropology. Available scientific evidence seems to suggest that Islam and Sufism (prayer and meditation) can contribute to the achievement of higher consciousness states.

KEYWORDS: Neurotheology; Consciousness states; Islam; Sufism
philosophy, sociology, cognitive science, neuroscience, psychology, and anthropology (Sayadmansour, 2014; Stausberg, 2010).

Islam is a monotheistic, Abrahamic religion, whose principles and beliefs are articulated by a religious book, called Qur’an, and by the teachings and normative examples (called sunnah, and composed of accounts called hadith) of the prophet Muhammad (570–632, peace be upon him), considered the last prophet of God (in Arabic language, Allah).

All Muslim believers are committed to observe religious duties: namely, to pray five times a day (as-salat), to do the almsgiving (az-zakat), to fast during the Ramadan month (as-sawm) and to do the pilgrimage to Makkah at least once in life, if physically and economically able (al-hajj). The profession of Islamic creed (ash-shahadah) completes the five pillars of Islam (arkan al-Islam).

Within Islam, Sufism (from Arabic suf, literally “wool”), has been a prominent spiritual tradition in Islam combining influences from major world religions, such as Christianity and Hinduism and contributing substantially towards spiritual and psycho-physical well-being (Nizamie et al., 2013).

The Sufism aims at establishing a deep and profound communion with God through spiritual realization and fulfilment; soul being the agency of this communion, and tending towards God, which is the cause of all existence and the only real existence.

Sufism has elaborated a complex theory of consciousness states (Renard, 2015):

- **ihsan** (literally “beautiful action”), which represents the responsibility to obtain and achieve perfection/excellence in worship and religious duties,
- **lataif-e sitta** (in Persian/Urdu) or **al-latta’ as-sitta** (in Arabic), the “six subtleties” or subtle centers, is the sensory/supersensory perception characterized by different levels:
  - **nafs**, the ego or the self, “the ego-self, natural self, carnal self” (Helminski, 2000), defined by the following appetitive qualities: pride (takabbur), greed (hirs), envy (hasad), lust (shahwah), backbiting (gheebah), stinginess (bokhl), and malice (keena). The process of self-transformation (tazkiya-I-nafs, or “purgation of the ego”, in Persian/Urdu) leads from nafs-e ammara (commanding ego or “compulsive ego”) to nafs-e lawwama (self-acusing ego) and, finally, to nafs-e mutma’inna (satisfied ego),
  - **qalb**, from an Arabic root meaning “to turn, rotate, fluctuate or vacillate”, the heart or the love, the organ of supra-rational enlightenment and intuition, conceived as an “isthmus” (al-barzakh in Arabic, Alam-e-Araf in Persian/Urdu) or a bridge between this world (dunya) and the next (akhirah), caught between the influence of the nafs and the ruh,
"sirr", the “innermost secret”, the “mystery” or the solar plexus, according to some scholars the conscience,

"ruh", the soul,

"khafı", the middle of forehead, and

"akhfa/ikhfa", the “most hidden” level, the soul’s origin and its perfection, the highest essence, leading to annihilation or fana’,

• "noor", which is the light and the knowledge,

• "maqaamat", which are the spiritual stations or developmental levels. According to the traditional Sufism, they are seven and represent the seven prophets of one’s inner being, namely:

• the "repentance", which can be considered as divided into three stages (tawba as the initial level of repentance, inaba as the sincere penitence, and aseba, turning to God in contrition, the final and highest stage of repentance),

• the "abstention" or wara’, which literally means watchfulness and abstinence,

• the "ascetism" or zuhd (literally meaning the renunciation),

• the "poverty" or faqr,

• the "patience" or sabr,

• the "confidence" or tawakkul (literally meaning the trust), and

• the "contentment" or ridaa (literally meaning the acceptance.

According to other Sufi traditions and schools, the "maqaamat are forty or even one hundred (Nasr, 1991),

• "haal", the spiritual state (plural ahwaal), which "denotes experiencing in one's inner world the "breaths" blowing from the realms beyond the world, and feeling the difference between the "night" and "day", as well as the "evening" and morning", that occur to the heart" (Fethullah Gülen, 2007). According to some Sufi scholars, they are ten, namely:

• "muraqaba", literally “constant attention”, the meditation or self-supervision (during which the individual feels sensations like taharrah or vibration, movement or fluttering of the heart, hararat or warmth, tadakkur or achievement of the aim, tabattul or being lost in meditation),

• "love" or mahabbah,

• "fear" or reverence or khasef,

• "spiritual yearning" or shawq,

• "proximity" or qurb,

• "hope" or rajaa’,

• "certainty" or yaqeem,

• "contemplation" or mushaahadah,
Ways of achieving higher consciousness states are:

• **dhikr**, the remembrance of God,
• **muhasaba**, self-criticism or self-interrogation,
• **samaa’**, the physically active meditation, which, according to some Sufi scholars, has different healing effects, such as restoring to consciousness fainted people, soothing crying infants, treating melancholia and some illnesses, giving joyful and pleasurable sensations (Avery, 2004),
• **hadhra**, the dance associated with dhikr,
• **taqwa**, from the Arabic root *wiyaya*, piety,
• **khalwat**, literally meaning “privacy”, the spiritual seclusion or ‘uzlat, and
• **qawwali**, the Sufi devotional music, which is quite widespread and popular in South Asia, in particular, in the Punjab and Sindh regions of Pakistan, in Hyderabad, Delhi and other parts of India, especially North India, in Dhaka, Chittagong and Sylhet divisions of Bangladesh.

We have attempted to briefly synthesize the complex Sufi doctrine. It should be emphasized that these growth and developmental stages are complex, sometimes overlapping and non-linear. Moreover, some concepts which are considered spiritual states by some scholars are considered spiritual stations by others, and vice versa.

Concerning the body of scientific evidences, Doufesh and coworkers (2014) have recruited a sample of thirty healthy Muslim men and have continuously recorded their electrocardiograms and electroencephalograms (EEGs) before, during, and after salat practice (the different steps of salat are pictorially shown in Figure 1).

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Figure 1. The different steps of the salat practice.
Power spectral analysis was conducted to extract the α relative power (RPα) and the heart rate variability (HRV) components. During salat, a significant increase was observed in the mean RPα in the occipital and parietal regions and in the normalized unit of high-frequency (nuHF) power of HRV. Meanwhile, the normalized unit of low-frequency (nuLF) power and LF/HF of HRV decreased according to HRV analyses. RPα showed a significant positive correlation in the occipital and parietal electrodes with nuHF and significant negative correlations with nuLF and LF/HF. Authors concluded that during salat, parasympathetic activity increased whilst sympathetic activity decreased, promoting relaxation, minimizing anxiety, and potentially reducing cardiovascular risk.

Austin (1999) investigated, among others, a subject who had engaged in Sufi meditation for eighteen years and experienced emotional arousal (free flow of tears during prayer practice and meditation), with an increase in the alpha frequency (from 11 to 12 cps).

Gutjahr and Mechleid have recorded EEG measurements which have corroborated from a scientific standpoint these traditions of at least a millennium (Guvenc, 2006; Mandel et al., 2005).

Bai and coworkers (2012) compared the cognitive functioning of Hui Muslims aged 60 and over who practiced salat prayer and/or did physical exercise with individuals in the same age group who did not engage in such practices (control group). Authors found that those in the group of participants who practiced SP or did PE demonstrated a similar level of cognitive functioning which was better than that of individuals who neither exercised nor prayed regularly.

Cakmak and colleagues (2017) investigated the structural cortical plasticity in 10 Sufi Whirling Dervishes (SWDs) versus 10 controls. Significantly thinner cortical areas for dervishes subjects were found compared with the control group in the hubs of the default mode network, as well as in the motion perception and discrimination areas including the right dorsolateral prefrontal cortex (DLPFC), the right lingual gyrus and the left visual area 5 (V5)/middle temporal (MT) and the left fusiform gyrus.

Taken together, meditation and prayer can contribute to the achievement of a higher spiritual and psycho-physical wellbeing. However further research in the field is urgently needed.
REFERENCES


