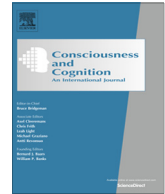




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How similar are the changes in neural activity resulting from mindfulness practice in contrast to spiritual practice?

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ABSTRACT

Meditation and spiritual practices are conceptually similar, eliciting similar subjective experiences, and both appear to provide similar benefits to the practicing individuals. However, no research has examined whether the mechanism of action leading to the beneficial effects is similar in both practices. This review examines the neuroimaging research that has focused on groups of meditating individuals, groups who engage in religious/spiritual practices, and research that has examined groups who perform both practices together, in an attempt to assess whether this may be the case. Differences in the balance of activity between the parietal and prefrontal cortical activation were found between the three groups. A relative prefrontal increase was reflective of mindfulness, which related to decreased anxiety and improved well-being. A relative decrease in activation of the parietal cortex, specifically the inferior parietal cortex, appears to be reflective of spiritual belief, whether within the context of meditation or not. Because mindful and spiritual practices differ in focus regarding the 'self' or 'other' (higher being), these observations about neurological components that reflect spirituality may continue work towards understanding how the definition of 'self' and 'other' is represented in the brain, and how this may be reflected in behaviour. Future research can begin to use cohorts of participants in mindfulness studies which are controlled for using the variable of spirituality to explicitly examine how functional and structural similarities and differences may arise.

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1. Introduction

Individuals who practice religiously and/or spiritually (R/S), and also those who practice mindfulness meditation, report a greater sense of compassion, wellbeing, feeling of wholeness, decreased anxiety, and faster recovery from mental illness (Cohen, Jimenez, & Mittal, 2010; Giovagnoli, da Silva, Federico, & Cornelio, 2009; Ivanovski & Malhi, 2007; Sasaki, Kim, & Xu, 2011; Shapiro & Walsh, 2003). Research has suggested that the processes trained by mindfulness meditation involve attention regulation, body awareness, emotional regulation (reappraisal, exposure, extinction, and reconsolidating), and perspective of the self (Hölzel et al., 2011a, 2011b). In this review, mindfulness meditation will be defined as 'an expansion of attention in a non-judgemental and nonreactive manner, in order to become more aware of one's current sensory, mental and emotional experience' (Ivanovski & Malhi, 2007). In contrast to mindfulness meditation, spiritual practice can be broadly defined as focusing on an internal and external sense of connection to a higher entity, or embodiment, such as Mother Nature. Almost every culture contains traditions of spiritual practice in one form or another. As spiritual practice is so widespread in human culture, everyone has a common understanding of the phenomenon, regardless of whether they practice R/S or not. However for the purposes of this paper; we will define spiritual practice as focusing on spiritual transcendence and connection with a higher entity(s), with methods such as prayer or spiritual meditation.

An aim of both mindfulness practice and spiritual practice is the enhancement of the subjective experience of the mind by focusing on positive emotion, which can result in an increased sense of social support, purpose in life, and a decrease in illness symptoms (Fredrickson, Cohn, Coffey, Pek, & Finkel, 2008). Evidence has also shown that spiritual practice directly improves emotional experience through an increased sense of meaning and hope, and alleviating feelings of fear and loneliness (Clark, Drain, & Malone, 2003). Similarly, mindfulness practice has shown to lead to a receptive and attentive attitude to self-attribution of emotion, increased coping strategies and greater wellbeing, as well as instilling compassion for the self and empathy for others (Weinstein, Brown, & Ryan, 2009). Both mindfulness and spiritual practice often approach enhancing the subjective experience of the mind in a similar manner, such as focusing on present moment experiences (e.g. through prayer or meditation), seeking transcendence (the process of developing higher consciousness), and fostering acceptance and monitoring of emotional responses. Further, research has demonstrated, through structural equation modelling, that daily spiritual practice enhances the practice of mindfulness towards psychological health benefits (Greeson et al., 2011).

Since both mindfulness meditation and spiritual practice display similar outcomes, both employ comparable methods, and have been shown through self-report measures to have a relationship (Greeson et al., 2011), we feel it is valuable to analyse what the similarities and differences are in terms of neural activation patterns and changes to neural structure resulting from each type of practice. Answering this question could further inform our understanding into the role that spirituality plays in illness recovery, and how much the attributes of R/S may contribute to the positive effects of mindfulness practice. It may also inform future research to what degree R/S may confound results that use mindfulness participants from different belief frameworks. If the role of R/S in mindfulness meditation is a beneficial variable, this information may further inform clinical research and practice.

Meditation is broadly used to describe attention training practices that observe and regulate the mind and the body (Cahn & Polich, 2006). These practices are often divided into concentrative practices, such as Transcendental Meditation (TM) and 'open-monitoring' or mindfulness practices. Concentrative meditation often involves a single point of focus, and often considered a more 'zoom-lens' attentional mechanism, often concentrated on a single point in the body (Valentine & Sweet, 1999) or a mantra, in the case of TM. Mindfulness meditation on the other hand has been used in recent years in medicine and healthcare to describe the practice of attentional focal non-reactivity to inner experiences, and often viewed as a 'broader spectrum' meditation, which encourages the free flow of any thought that may pass through consciousness, with no specific extra attention paid to any particular thought (Sayadaw, 1972). There are a range of traditional meditation practices and traditions that emphasise mindfulness, such as Zen and Vipassana (insight) meditation, and these are based upon traditional practices, such as used in Buddhist culture. There are also a number of modern psychological therapies that include mindfulness as a central component, including mindfulness based stress reduction (MBSR), mindfulness-integrated cognitive behaviour therapy (MiCBT), acceptance and commitment therapy (ACT) and mindfulness based cognitive therapy (MBCT) (Ivanovski & Malhi, 2007). These therapies have proven effective in treating generalised

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