Mindfulness meditation and explicit and implicit indicators of personality and self-concept changes

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Abstract
The scientific interest on mindfulness meditation (MM) has significantly increased in the last two decades probably because of the positive health effects that this practice exerts in a great variety of clinical and non-clinical conditions. Despite superior attention regulation, emotional regulation, and body awareness have been argued to be critical mechanisms through which MM improves well-being, much less is known on the effects of this practice on personality. Here we review the current state of knowledge about the role of MM in promoting changes in practitioners’ personality profiles and self-concepts. We first focus on studies that investigated the relations between mindfulness and personality using well-known self-report inventories such as the Five-Factor model of personality traits and the Temperament and Character Inventory. Second, based on the intrinsic limitations of these explicit personality measures, we review a key set of results showing effects of MM on implicit, as well as explicit, self-representations. Although the research on MM and personality is still in its infancy, it appears that this form of meditative practice may notably shape individuals’ personality and self-concept toward more healthy profiles.

Keywords: Mindfulness meditation; personality inventory; character; self-concept; explicit-attitude; implicit-attitude.
Introduction

Meditation originated in India several centuries BCE, in Hinduism and Buddhism healing and spiritual traditions and since then various meditative practices are followed to promote well-being and cognitive/emotional balance (Wynne, 2007; Fabbro, 2010; Lutz et al., 2008). Over the past 30 years, an important form of meditation has taken hold in the West, in both clinical and non-clinical contexts, namely mindfulness meditation (MM) (Kabat-Zinn, 1982; 1990; 2003). MM relies upon techniques of mental training that suggest that nonjudgmental awareness of here-and-now mental or somatosensory experience positively influences accuracy of perception and acceptance of one’s own life experiences. The mindful practitioner thus amalgamates a focused attention component with a non-judgmental attitude of openness and receptivity when trying to intentionally pay attention, and non-reactively monitor, the content of present-moment experience (Brown and Ryan, 2003; Lutz et al., 2008).

The growing interest in MM is probably due to its well-documented beneficial effects on physical and psychological health, which have been obtained in different clinical contexts on individuals of various age ranges and with slightly different formalizations of mindfulness-based therapies (Baer, 2003, 2010; Didonna, 2009). Outside of the clinical setting, recent applications of MM interventions have proven useful both in the field of education for teachers and pupils’ psychological well-being (Burke, 2009; Black et al. 2009; Zenner et al., 2014) and for older people to better cope with physiological, age-related neurocognitive decline (Gard et al., 2014; Luders, 2014; Crescentini et al., 2014a). Moreover, another important dimension of MM is its potential in promoting personal development such as equanimity, self-compassion, and perspective taking (Birnie et al., 2010; Baer, 2010; Hölzel et al., 2011; Neff, 2003).

Together with this body of knowledge pointing to the health benefits of MM, another research line has aimed at identifying the mechanisms of action through which MM exerts its effects. Thus, the role of a series of interrelated components such as attentional control, emotion regulation, body awareness, and change in perspective on the self has been recognized (Hölzel et al., 2011). Among these factors, attention regulation is considered a fundamental prerequisite for the development of the other mechanisms and mindfulness skills (Hölzel et al., 2011; Shapiro et al., 2006; Malinowski, 2013). Nevertheless, while several studies have focused on the relation between MM and enhancement of attention and emotion regulation skills (e.g., Malinowski, 2013; Lutz et al., 2008; Jha et al., 2007), relatively little empirical research has investigated whether MM promotes changes in the perspective on the self and, more generally, in personality traits (Hölzel et al., 2011; Campanella et al., 2014).

However, a central tenet of MM is that the practitioner learns to experience the transient nature of all mental phenomena, gaining distance from identification with a static sense of self and possibly developing new ways to experience and face life events (Kabat-Zinn, 1990; Hölzel et al., 2011; van den Hurk et al., 2011). From this perspective, the study of the relation between MM and personality is of some importance as it is reasonable to expect modifications in personality traits as due to the practice of this form of mental training.

Mindfulness meditation and explicit measures of personality and self-concept changes

One of the first studies documenting a change in individuals’ self-concept as due to MM has been that of Emavardhana and Tori (1997), who reported higher self-acceptance, increases in overall self-esteem and a more positive self-representation (measured with the Tennessee Self-Concept Scale; Roid and Fitts, 1988), in two large groups (overall n=438) of 18-years old participants attending a one-week mindfulness retreat (i.e., vipassana meditation) vs. a control
group of young participants (n=281) (see Nystul and Garde, 1977 for similar findings in the context of transcendental meditation; see also Turnbull and Norris, 1982).

More recently, several studies have further investigated the relationship between MM and personality relying on well-known personality inventories. Many of these studies have tried to link mindfulness skills, rather than MM practice, with personality traits using the Five-Factor model of personality (e.g., Costa and McCrae, 1992). For example, Thompson and Waltz (2007) employed the Mindful Attention Awareness Scale (MAAS, Brown and Ryan, 2003), a 15-item mindfulness scale regarding levels of attention and awareness in daily life, finding that greater mindfulness scores were negatively related with the neuroticism trait (propensity toward anxiety, worrying, moodiness, and impulsiveness) but positively related with the agreeableness (the tendency to be trustworthy and altruistic) and conscientiousness (the inclination to be efficient, organized and to show high self-discipline) traits. Similarly, Barnhofer et al. (2011) have shown protective effects of everyday mindfulness (Five-Facet Mindfulness Questionnaire, FFMQ, Baer et al., 2006) against negative effects of neuroticism (measured with the Eysenck Personality Questionnaire; Eysenck and Eysenck, 1975) on depressive symptoms. Moreover, other studies have documented negative correlations between mindfulness or self-compassion and neuroticism (Ortner et al., 2007; Brown and Ryan, 2003; Neff et al., 2007). These and other data linking mindfulness skills and personality traits have recently been subjected to meta-analysis (Giluk, 2009) involving 29 studies addressing the relationship between dispositional mindfulness (measured for example with the MAAS, FFMQ, and Kentucky Inventory of Mindfulness Skills, KIMS; Baer et al., 2004) and the Big-Five personality traits (conscientiousness, agreeableness, extraversion, openness-to-experience, and neuroticism) as well as trait affect (Positive and Negative Affect Schedule, Watson et al., 1988). Overall, this meta-analysis confirmed that mindfulness negatively correlates with neuroticism and negative affect but positively with conscientiousness and positive affect.

Although valuable, these studies interested in the relationship between everyday mindfulness and personality leave open the question of the impact of regular MM practice, for instance during an 8-week intervention or in expert practitioners, on mindfulness and personality variables. Of importance, a recent study by van den Hurk et al. (2011) has recently made an important step towards understanding the contribution of MM practice. In this cross-sectional study the authors compared the personality profiles (using the NEO-Five Factor Inventory; Costa and McCrae, 1992) of two groups of healthy participants (age range, 27-75 years) with (n=35; mean meditation experience: 13.2 years, 3.0h a week) and without (n=35) MM experience. The mediating role of mindfulness skills (measured with the KIMS) in the relationship between MM practice and personality traits was also investigated (see Fig 1 in van den Hurk et al., 2011 for results). Meditators showed higher openness-to-experience scores (reflecting dispositional curiosity, creativity) than non-meditators but lower conscientiousness scores than the latter. With regards to the practice of MM, this was negatively related to neuroticism and positively related to openness-to-experience and extraversion (the tendency to experience positive emotions and being sociable). Although the cross-sectional nature of the study may limit the interpretation of the results, the authors concluded suggesting that MM practice is associated with positive affect and increased levels of curiosity and openness-to-experience while helping, at the same time, to reduce moodiness and worrying as well as leading to a reduced focus on achievements (related to the conscientiousness trait).
Another well-known personality inventory refers to the psychobiological model of Temperament and Character (TCI) (Cloninger et al., 1993, 1994). This model combines theorized neurobiological and genetic bases of personality, articulated in four temperamental traits (Novelty Seeking, Persistence, Reward Dependency, and Harm Avoidance), with their interactions with environment and life experiences that contribute to shape the character. The latter consists of three dimensions measuring the maturity of the self at the levels intrapersonal (Self-Directedness that maps on concepts such as self-esteem and self-efficacy), interpersonal (Cooperativeness expressing the capacity to be empathic, tolerant and compassionate), and transpersonal (Self-Transcendence measuring the tendency towards spirituality and creativeness). Thus, the character refers to one’s own self-evaluation and is responsible for efficient behavioral self-regulation; indeed, character profiles are useful to diagnose personality disorders, in that individuals with immature character (e.g., with low Self-Directedness and Cooperativeness) are at higher risk of developing personality disorders than individuals with better character maturity (Svrakic et al., 1993, 2002).

Only a few studies have used the TCI to investigate the relationship between mindfulness skills or MM practice and personality traits. Haimerl and Valentine (2001) compared cross-sectionally the TCI character profiles of three groups of Buddhist meditators with varying levels of meditation experience (28 naïve individuals; 58 beginners with less than 2 years of practice; and 73 experts with more than 2 years of experience). Indicative of greater overall self-maturity, expert meditators obtained higher scores in all three aspects of character compared to naïve subjects and they also scored higher than beginners on the cooperativeness trait. Moreover, beginners scored higher than naïve individuals on the self-transcendence scale. This study thus showed that progresses in meditation experience led to positive growth in the character components of personality. Extending these findings on meditation practice to everyday mindfulness skills, a recent study conducted on individuals with Attention Deficit Hyperactivity Disorder (ADHD) and on non-ADHD controls has found positive associations between KIMS and Self-Directedness and Self-Transcendence scores (Smalley et al., 2009).

Similarly to the conclusions that can be drawn from the studies using the Five-Factor model of personality, the correlative nature of these two studies may limit the possibility of linking MM with the beneficial changes in the perspective on the self. Nevertheless, a recent longitudinal study by Campanella et al. (2014) was able to test more directly the effects of MM practice on individuals’ TCI personality profiles. This was done in three groups of meditation-naïve healthy subjects (overall n=41, age range: 21-58 years) who, differently from a fourth group of healthy controls (n=15, age range: 26-69 years), participated in three replicates of an 8-week MM course inspired by the mindfulness-based stress reduction. Notably, the authors reported increased scores in all three character scales after vs. before the MM course in two of the three meditation groups. In the third group and in the control group the TCI profiles remained unaltered across the two testing sessions in which the questionnaire was administered. Remarkably, it was found that the individuals who showed an increment in the character scores had meditated more frequently than those not showing any character change during the course (4-5 vs. 2-3 days per week).

Overall, the reviewed studies above suggest that MM may indeed promote positive changes in individuals’ self-concept and personality. This may help further characterizing the change in the perspective on the self as an important mechanism of action through which MM exerts its beneficial health effects. In particular, this change in perspective could be supported by a mindfulness-related increased ability to start experiencing the sense of self as a transitory event rather than as a constant and unchanging entity (Hölzel et al., 2011). The detachment
from identification with a static sense of self may provide MM practitioners with a better
capacity for objectivity about their own internal experience that, in turn, could help them
experience more authentic ways of being and reduce psychological suffering (Hölzel et al.,
2011; Shapiro et al., 2006).

Tellingly, recent functional imaging studies have identified the putative neurofunctional
signatures of the change in the perspective on the self brought about by MM. In particular, it
has been claimed that detachment from identification with a static sense of self leads to
diminished self-referential, narrative/autobiographical, processing and enhanced first-person,
present-based, experiential processing during MM states (Farb et al., 2007): this has been
shown to reflect in the brain in decreased activity in self-referential cortical midline structures
(e.g., medial prefrontal cortex, posterior cingulate cortex/precuneus; see Northoff and
Bermpohl, 2004; Northoff et al., 2006) and enhanced activity in lateral structures such as the
insula and the somatosensory cortex associated more with momentary interoceptive and
exteroceptive self-awareness (see Hölzel et al., 2011 for review of other relevant functional
and structural neuroimaging studies on MM and changes in the perspective on the self; see
also Tomasino et al., 2013).

Mindfulness meditation and implicit measures of personality and self-concept changes

People have two sources of self-evaluative tendencies. The first relies on propositional
processes of intentional reasoning that shapes individuals’ explicit attitudes through well-
articulated beliefs and motivations. By contrast, the second source roots in associative and
automatic processes in which intuitive feelings and evaluations, that one could or could not be
aware of, shape individuals’ implicit attitudes (Gawronski and Bodenhausen, 2006; Jordan et
al., 2007). Experiencing psychological conflicts between intuitive feelings and more reflective
evaluations is common in daily life decisions, with such conflicts also affecting more personal
spheres, concerning self-attitudes and self-representations (Emmons and King, 1988;
Gawronski and Bodenhausen, 2006; Greenwald and Banaji, 1995). Notably, while
concordance between implicit and explicit self-representations is important for psychological
health, incongruities between the two forms of self-evaluation have been put into relation with
different forms of psychological distress. For example, unhealthy forms of perfectionism may
occur when one shows high implicit self-esteem but low explicit self-esteem (Zeiger-Hill and
Terry, 2007; see also Bosson et al., 2003; Briñol et al., 2006; Gawronski and Bodenhausen,
2006; Schröder-Abé et al., 2007a, 2007b).

On the basis of these premises, it may seem important for studies interested in the impact
of MM upon changes in the perspective on the self to also investigate possible effects at the
implicit level of self-representation. This appears critical for at least two reasons. First, linking
mindfulness with implicit self-concept, namely a specific type of implicit cognition, may help
to “cross-validate” findings from self-report, explicit measures of personality change that may
be particularly susceptible to desirable responding as well as being subjective in nature
(Jordan et al., 2007; Schwarz, 1999). Second, and perhaps more importantly, these studies
could test whether mindful awareness promotes a coherent self in which implicit and explicit
self-representations become better integrated with each other. Despite intuition and implicit
cognition are likely important aspects of mindfulness, as this practice is believed to foster self-
insights and greater acceptance of one’s own internal states, we should note that most of the
studies on the impact of everyday mindfulness or MM on personality and self-concept have
only considered explicit self-report measures.
Nevertheless, a few relevant exceptions exist, being represented by studies focusing on the impact of mindfulness on psychological dimensions such as implicit affective states, self-esteem, and motivation (Brown and Ryan, 2003; Koole et al., 2009; Levesque and Brown, 2007; Sauer et al., 2011; see also Hutcherson et al., 2008 and Strick et al., 2012 for similar issues in the context of Loving-Kindness meditation and Zen meditation, respectively).

Overall, these studies have been particularly interested in the putative effects of everyday mindfulness or transient state mindfulness (i.e., promoted by brief, single-session MM exercises) on implicit and explicit self-representations and/or their potential concordance. Thus, in their pioneering study, Brown and Ryan (2003, Study 3) used an implicit association test (IAT), namely one of the most frequently used implicit tests to assess people's implicit attitudes (Greenwald and Farnham, 2000; Schnabel et al., 2008), to measure individuals’ emotional well-being at an implicit level (affective states were also assessed using self-report measures) and found that MAAS scores predicted concordance between implicit and explicit affect: there was a closer relation between explicit and implicit affective experience in meditation naïve individuals (n=78) with high versus low MAAS scores. Another important study has recently extended these findings to self-esteem (Koole et al., 2009). In particular, it was shown that brief MM exercises, carried out by young naïve participants (overall n=188), led to greater congruence between explicit and implicit (i.e., name-letter preference task) measures of self-esteem specifically when they were executed before, rather than after, completing the two types of self-esteem.

Notably, these studies interested in dispositional or transient state mindfulness left unaddressed the issue of whether regular MM practice, for instance during an 8-week mindfulness-based intervention, directly affects implicit as well as explicit self-concepts. This is an important issue that was addressed by our research group in a recent study (Crescentini et al., in press). In particular, we assessed the changes in explicit (e.g., Self-Transcendence scale of the TCI) and implicit (using a recently developed IAT for religiousness/spirituality, RS; Crescentini et al., 2014b) RS self-representations in meditation-naïve individuals participating to an 8-week MM program. Remarkably, we found that MM led to widespread increases in explicit RS and to more circumscribed increases in implicit RS occurring in the individuals with low pre-existing implicit RS (i.e., before the MM training). Moreover, the two RS measures globally tended to increase congruently after vs. before the training.

Generally, the reviewed studies suggest that mindfulness skills and MM practice may have an impact on implicit self-concepts. This is important if one considers that implicit attitudes may be more difficult to transform than explicit attitudes; while the latter may represent recently acquired self-representations coexisting with the former, implicit attitudes could reflect more stable and older evaluative representations that have their origins in long-term personal experiences (Wilson et al., 2000; Gawronski and Bodenhausen, 2006). Development of mindful awareness thus appears able to impact responding at an automatic level and it could therefore be involved in gradually transforming habitual patterns of responding. The current data, however, are not clear enough to show whether this occurs through increased access to previously inaccessible implicit self-representations or via enhanced reliance on (accessible) implicit feelings and self-concepts (Brown and Ryan, 2003; Chambers et al., 2008; Koole et al., 2009; Strick et al., 2012). Regardless of the mechanisms through which mindfulness may impact implicit self-concepts, the reviewed data suggest that this practice fulfills important self-regulatory functions, for instance by letting intuitive self-attitudes to be more easily attuned and integrated into explicit self-attitudes, thus contributing to a more coherent self-image.
Conclusions

The aim of this study was to review findings of studies investigating the relationship between mindfulness skills and MM practice and changes in personality and in the perspective on the self, a putative crucial mechanism of action through which mindfulness exerts its beneficial effects on health and well-being. Most of these studies addressed changes occurring at an explicit level using self-report measures of personality and self-concept changes. However, a few studies also focused on changes occurring at a deeper, implicit level. Although the research on MM and personality is still in its infancy, warranting further investigations on both levels of explicit and implicit self-concepts, the reviewed studies suggest that, operating on aspects such as sense of responsibility, authenticity, compassion, and self-acceptance, this form mental training may significantly shape individuals’ personality toward a more coherent and healthy sense of self and identity.

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Conflict of Interest Statement

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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