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Meta-awareness as fundamental working mechanism in mindfulness meditation

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Abstract *Over the last several decades there has been a considerable increase in the application and research on mindfulness meditation and its effects. By contrast, there have been relatively few conceptual papers defining the concept of mindfulness meditation and its supposed working mechanisms in psychological terms. Recently, Holzel and colleagues made an insightful attempt to integrate influential conceptualizations of mindfulness with available clinical, psychological and cognitive neuroscientific research findings. They identified four working mechanisms of mindfulness meditation, (a) attention regulation, (b) body awareness, (c) emotion regulation, and (d) change in perspective on the self. In our view, a fundamental mechanism seems missing or at least is not explicitly denoted as such, i.e., meta-awareness. We propose to define meta-awareness as an additional working mechanism – even more as a fundamental mechanism subserving all the others - on the basis of conceptual, phenomenological and neuroscientific motives. Finally, we would like to encourage research on this psychological process and its crucial role in mindfulness meditation and related effects.*

Over the last several decades there has been an enormous increase in the application and research on mindfulness meditation and its effects. It was in the late 1970's that Jon Kabat-Zinn developed the Mindfulness Based Stress Reduction program for people suffering from chronic pain (Kabat-Zinn, 1982). After the development of the MBSR program for chronic pain patients the program was applied in many more contexts. Feasibility and efficacy studies showed that the MBSR program has beneficial effects for people suffering from a wide variety of psychological (Hofmann, Sawyer, Witt, & Oh, 2010), psychosomatic and somatic disorders such as eating disorder, anxiety and chronic pain (Chiesa & Serretti, 2010). Over time the practice of mindfulness meditation and its effects also attracted attention from more fundamental psychological and neuroscientific researchers and a surge can be seen in the number of scientific articles on mindfulness meditation in the last decade or so. It is remarkable to see that there are relatively few conceptual papers addressing the constitution of the psychological concept of mindfulness meditation, its working mechanisms and its supposed effects. A few examples of such works include Shapiro (Shapiro, Carlson, Astin, & Freedman, 2006), Bishop (Bishop et al., 2004), Baer (Baer, 2003) and Brown and Ryan (Brown & Ryan, 2003). Interestingly, these conceptual proposals have in common to assign critical roles to such factors as attention and emotion regulation. The latest conceptual work stems already from several years back, despite the availability of an increasing amount of scientific evidence to test the proposed psychological conceptualizations. For this

reason the work of Holzel et al. (Holzel et al., 2011) has been very welcome and of great relevance to the ever expanding field of mindfulness meditation research.

In their 2011 paper in Perspectives on Psychological Science Holzel et al. made a meticulous and insightful attempt to integrate conceptual mindfulness frameworks with available clinical, psychological and cognitive neuroscientific research findings on mindfulness meditation (Holzel, et al., 2011). The aim of the review paper was to integrate existing literature into a comprehensive framework and to explore several components through which mindfulness meditation exerts its effects. These components or working mechanisms of mindfulness meditation involve (a) attention regulation, (b) body awareness, (c) emotion regulation, and (d) change in perspective on the self.

Attention regulation is considered essential by many meditation traditions and is thought to act as a fundamental building block in the practice. Usually the ability to focus attention on a single object for a longer period of time (focused attention) is to be trained first. Over time participants report to be able to focus their attention for an extended period of time and distractions disturb this focus less frequently (Barinaga, 2003). After this form of attention has been cultivated the practitioner is encouraged to develop what is called a form of open monitoring attention. This concept refers to the idea that attention is not supposed to be focused on a single object but to be gently attached and detached from objects passing by in the stream of awareness.

Body awareness is conceived as the ability to notice subtle bodily sensations (Mehling et al., 2009). During mindfulness meditation the focus of attention is often a bodily

sensation as for example the breathing. Bodily sensations function as an anchor for focused attention in order to prevent attention to cling to mind related objects such as thoughts.

Emotion regulation stands for the alteration of ongoing emotional responses through the action of regulatory processes (Ochsner & Gross, 2005), thereby referring to a wide array of strategies for altering emotional responses. In their article, Holzel and co-authors focused on reappraisal (i.e., reinterpreting the meaning of a stimulus to change one's emotional response to it), and exposure, extinction and reconsolidation (stimulus-response reversal) and found neuroscientific evidence to support the view that these strategies play a role in enhanced emotion regulation associated with mindfulness meditation.

Finally a change in perspective on the self is addressed as a working mechanism of mindfulness meditation. One of the central tenets in Buddhist psychology is the idea of non-self, or more precisely that there is no such thing as a permanent, unchanging self (Olendzki, 2010). In more detail, the sense of self is a repeatedly arising process in the stream of mental events and highly experienced meditators claim to observe this mechanism by enhanced meta-awareness. Such meta-awareness facilitates a detachment from identification with the static sense of self and the sense of self can rather be experienced as an event (Olendzki, 2006). Realizing the transitory nature of self has been postulated to lead to the non pathological deconstruction of the self (Epstein, 1988). Whereas such a profound realization seems exclusive to the advanced practitioner, the authors stress that de-identification from some parts of mental content

is often experienced even in the earliest stages of meditation practice. Some neuroscientific findings are reviewed that might tap into this proposed mechanism of mindfulness.

As stated before, the work of Holzel and colleagues has been very welcome and is of great relevance to the field of mindfulness meditation research and beyond. They have been able to make a high quality integration of conceptual frameworks with a large body of scientific research findings. The eventual postulation of the four working mechanisms of mindfulness meditation seems therefore insightful as well as complete in the sense of encompassing both a wide variety of conceptual frameworks and an extensive amount of scientific knowledge. Moreover, the working mechanisms described by Holzel et al. seem to have a clear role in subserving the beneficial effects of mindfulness meditation. In our view, however, a fundamental mechanism seems missing or at least is not explicitly denoted as such. The component or working mechanism we are referring to relates to the psychological function of meta-awareness or otherwise defined as reflexive awareness or reflexive consciousness (Schooler, 2002; Teasdale, 1999), i.e., the explicit awareness of the contents of consciousness and of the processes of being conscious itself. Holzel and colleagues already shortly touched upon the concept of meta-awareness when discussing the change in the perspective on the self. They, however, did not speak of meta-awareness as a separate working mechanism and only discussed its role in the context of a change in perspective on the self. We would like to propose to assign the process of meta-awareness not just the role of an additional working mechanism, but rather as a fundamental mechanism subserving all

the others. We propose to explicitly distinguish this process from the other working mechanisms on the basis of conceptual and phenomenological motives, but we also expect this working mechanism to have a unique neural correlate of its own thereby being separate from the other factors also at the neural level.

Holzel and colleagues already pointed out that “meta-awareness is a form of subjective experience and executive monitoring, in which one takes a nonconceptual perspective as a distributed form of attention toward the contents of conscious experience and the processes involved. It is not entangled in the contents of awareness and facilitates a detachment from identification with the static sense of self. In place of the identification with the static self, there emerges a tendency to identify with the phenomenon of ‘experiencing’ itself” (Holzel et al., p. 547). Crucially, meta-awareness seems not only to underlie the change in perspective on the self, but also to play a central role in such mechanisms as attention regulation and emotion regulation. For example, the ability to reside with the phenomenon of experiencing/awareness itself, instead of having your awareness caught in the contents of conscious experience (i.e., identifying with the episodic narrative), fosters the ability to become less reactive to affective stimuli, i.e., underlies improved emotion regulation. Consequently, meta-awareness should not be equated with either exposure or reappraisal, but rather viewed as an underlying mechanism enabling these processes to occur. Holzel and colleagues already illustrated and explained the crucial role meta-awareness plays in the change in perspective on the self, however, also during attention regulation meta-awareness seems essential. Namely, one should be able to monitor where the focus of attention is at a certain

moment in time in order to redirect the focus of attention to the current task-relevant material, i.e. deploy meta-awareness of attention. Thus, in our view, meta-awareness seems a distinct and essential working mechanism in addition to the four working mechanisms proposed by Holzel and colleagues. Moreover, it seems an underlying mechanism that facilitates the other working mechanisms to come into play.

Another way of inspecting the central role of meta-awareness in mindfulness meditation is by considering the characteristics of a mindful state of mind. A mindful state of mind is characterized by a high level of alertness, with clear perceiving of mental stimuli and processes yet without becoming reactive to them as a result of an attitude characterized by openness and acceptance. Clearly, such a state shows great similarities to the process of meta-awareness. During meta-awareness one is also clearly aware of mental stimuli and processes and the ability not to react to them is essential, because becoming reactive to them makes an end to the process of meta-awareness. Thus, meta-awareness seems to have great overlap with a mindful state of mind and to play a central role in mindfulness meditation.

As a result of training meta-awareness one cultivates the ability to observe all contents and processes of conscious experience as they arise and pass and practitioners come to realize the transient nature of these. This realization promotes the loosening of the identification with the contents of conscious experience and ultimately results in identification with awareness itself, as has been reported by highly experienced practitioners. This process can be understood as the liberating process referred to by many Buddhist meditative practices. Thus, by including meta-awareness as a separate

working mechanism in the framework of mindfulness meditation the fundamental liberating process that is central to many Buddhist contemplative traditions is also taken into account.

Considering the four working mechanisms proposed by Holzel and colleagues it is hard to decipher their specific relationship with the process of developing insight. In mindfulness practice and its effects insight seems an essential ingredient. By some it even has been included as a separate element in conceptualizations of mindfulness meditation (Brown, Ryan, & Creswell, 2007). Neither improvements in attention regulation nor emotion regulation can directly explain how insight into one's cognitive and affective functioning is gained. Meta-awareness, however, enables a detached viewing of the contents of conscious experience and the processes involved. Therefore, by including meta-awareness as a separate working mechanism, it becomes clear how the practice of mindfulness meditation enables the development of a greater insight into the working of mind.

At this point we would like to discuss the function of meta-awareness and the fundamental processes it enables to be viewed upon in more detail. In classical Buddhist psychology there is the notion of so called citta's and cetasika's (Bodhi, 1993). Citta's are considered the discrete mind moments with each having an arising, presence and dissolution. The linear sequence of citta's makes up the stream of the contents of consciousness. Each citta is directed towards an object, i.e., input coming from the senses. Importantly, in Buddhist psychology the senses include the five physical senses as well as the mind. Besides being directed towards an object there is the 'coloring' of

the citta as determined by several so called cetasika's (mental factors). In other words, the very appearance of citta's might be equated with cognizing, whereas the coloring of the citta's by cetasika's might be viewed as concurring affect processes. Normally, the occurrence of citta's and concurring cetasika's remains largely unnoticed. However, practicing mindfulness meditation, in particular the cultivation of meta-awareness, facilitates the ability to view the occurrence of these fundamental mind processes. This results in a detached view on the contents of conscious experience and the processes involved, enabling proliferation of insight in fundamental mind processes. Moreover, it is thought that such meta-awareness induces a form of deconditioning as automatic responding is prevented.

Improvements in attention regulation are supposed to be reflected in enhancements in the neural circuits underlying attentional processing (fronto-parietal networks), whereas improvements in emotion regulation (fronto-limbic networks) and body awareness (e.g. somatosensory cortex, insula) are supposed to be reflected in alterations in the corresponding neural networks. Importantly, Holzel et al. already referred to a considerable body of neural evidence pointing in these directions. We would like to underline the point that enhanced meta-awareness is not supposed to be found in either one of these neural networks, but might rather be reflected in a separate neural mechanism (e.g. anterior PFC activity). In our view, there is great scientific insight to be gained with respect to which neural mechanism subserves the form of meta-awareness as described above, its role in mindfulness meditation and related effects and how this

neural mechanism might interact with the other neural mechanisms referred to above in the framework of mindfulness meditation.

To conclude, on the basis of conceptual, phenomenological and neural insights we would like to assign the process of meta-awareness a unique, central role in the practice of mindfulness meditation, i.e., a fundamental working mechanism subserving all the others. In our view, adding the definition of meta-awareness as a fundamental working mechanism to the framework of mindfulness meditation is a crucial step in pushing forward the scientific field investigating the concept of mindfulness meditation. We therefore would like to encourage research on this fundamental psychological process and its pivotal role in mindfulness meditation and related effects.

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