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THE WANDERING MIND, THE FOCUSSED MIND, THE META-AWARE MIND

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ABSTRACT

Caught within fast paced- urban industrial society, many of us may not ask questions about the nature of our mind, thoughts, although our mind, and thoughts often cause distress to us. Stressed between demands of tasks, and unexpected situations like pandemic loneliness, our paper offers useful insights into the dynamics of consciousness- the wandering mind (intentional, & unintentional mind-wandering), focussed mind, the meta-aware mind (mindfulness). We comparatively analyse results from contemplative traditions (Buddhism, & Yoga), Cognitive Phenomenology, and Cognitive Psychology (Attention, working memory), with focus on attention training exercises (meditative practises). What is the relation between attention, and our thoughts? How can we train our attention, by practising meta-awareness, to effectively manage distressing thoughts, and emotions? How do the concepts of intentionality, and meta-awareness bear on the problem of differentiating between intentional consciously controlled, and unintentional automatic mind-wandering ? If, as Metzinger suggests, our mental life is often characterized by sub-personal cognition, loss of mental autonomy, then what practices may help us to cultivate intentionality & meta-awareness? Does sub-personal cognition (e.g.mind-wandering) necessarily involve loss of agency, or as Seli has suggested, there are specific subtypes of mind-wandering that preserves intentionality and meta-awareness (at least at some later part of the time of the mind-wandering episode). In a convergence between application of Intentional Mind Wandering positive Self Generated Thoughts, and contemplative practices, suggested in the Patanjali Yoga tradition, we suggest a generalized meditative technique to counterbalance distressing thoughts. Commonly experienced distressing thoughts like aggression, jealousy, lust, despondency can be counter-balanced by systematically cultivating (Pratipaksha bhavana) opposing, and virtuous thoughts as further developed in the paper. Our paper explores, with focus on practical application via meditative practises, synergy between intentional mind wandering, meta-awareness (Sakshi bhava), Virtuous attitude Cultivation which have been shown to be effective in managing distressing thoughts e.g. depressogenic automatic negative thoughts.

Keywords: Meta-awareness, Intentional mind wandering, Meditative practices, automatic thoughts, Patanjali Yoga Sutra, Samatha, Vipassana

Ekāyano ayaṃ, bhikkhave, maggo sattānaṃ visuddhiyā, sokaparidevānaṃ samatikkamāya, dukkhadomanassānaṃ atthaṅgamāya, ñāyassa adhigamāya, nibbānassa sacchikiriyāya, yadidaṃ cattāro satipaṭṭhānā. -- Mahāsatipaṭṭhāna Sutta

This is the one and only way, monks, for the purification of beings, for the overcoming of sorrow and lamentation, for the extinguishing of suffering and grief, for walking on the path of truth, for the realisation of nibbāna: that is to say, the fourfold establishing of awareness.-- Mahāsatipaṭṭhāna Sutta

General Introduction

At the outset of the paper, we would like to introduce the key concepts. The paper seeks to explore interrelations between off-task (cognition) and on-task (cognition). Given differences in meanings and consequent interpretations, we clarify the working definitions used in this paper. Mind Wandering (MW) is defined as cognition which is unrelated to the current task at hand and is roughly synonymous with task unrelated thoughts, that is off-task thoughts. Attention can be defined as a cognitive process by which one actively selects environmental information (i.e. sensation) or actively processes information from internal sources (i.e. visceral cues, or other thought processes) (**University of Alberta, Cognitive Science Dictionary). On task attention refers to selectively attending (stimuli related) to the current task at hand. Adopting one of the central findings of Cognitive Science, viz. Limited Capacity Constraint (e.g. attentional bottleneck in divided attention studies) we explore how shifts in attention due to MW leads to decreased attention to the current task at hand. Given its complexity MW is categorized according to various criteria- temporal direction, presence or absence of intention. MW can be intentional or unintentional. Phenomenology of intentional mind-wandering (IMW) involves a sense of agency, meta-awareness. In contrast, unintentional mind-wandering (UMW) involves a shift of attention away from the current task at hand which lacks a sense of voluntary agency and meta-awareness (e.g. repetitive intrusive thoughts in OCD, where meta-awareness may be present but sense of intentional agency is lacking). Phenomenologically meta-awareness of “focus of attention” having shifted away from the current task at hand, occurs after initiation of UMW.

In this paper we comparatively analyse inter-relation between MW, on task attention, and mindfulness utilizing perspectives from three allied disciplines. These disciplines are cognitive psychology, cognitive phenomenology, and Indian philosophy. While comparing we conceptually map the concepts from Indian philosophical tradition onto concepts in psychology.

Introduction- Indian Philosophy

In analysing the relation between MW and Mindfulness, we employ concepts from Indian philosophy- specifically from the tradition of Yoga, and Buddhism. Indian philosophical and contemplative traditions have rich heritage of explorations into, and debates expressed through the aphorism-commentary (Sutra/ Sutta - Bhāṣya) literature. Ignorance (Avidyā) and MW (Citta Vikṣepa) are the two major hindrances while establishing oneself in meditative practises. Our concern in this paper is MW (Citta Vikṣepa) and its relation with Mindfulness (Vipāssana), and other meditative practises.

Meditative practises can be conceptualized as attention training exercises, and classified as depending on dynamics of attention, or processes involved in specific meditations. Consequently, meditative practises can be broadly classified as OMM (Open Monitoring Meditation), FAM (Focussed Attention Meditation), LKM (Loving Kindness Meditation) (Lippelt, Hommell, Colzato 2014)). Seeking further insight into interrelation, we map relations between - meta-awareness, intentional mind wandering, LKM on one hand and cognate Indian concepts like Citta Vikṣepa, Sākṣī bhāva, Pitti/Metta Bhāvanā with view to elucidate relations between MW and Mindfulness. It is hypothesized that the relation between MW and Mindfulness / on-task attention, instead of being dialectical is divergent and complementary. We further employ the distinction between IMW and UMW in the light of Indian meditative practices e.g. Pratipakṣha Bhāvanā (cultivating the opposite attitude) to question the opinion that MW is negative (cognitive cost) and develop testable hypothesis / model/ practise to harness the potential in Mind Wandering/ Self generated thought (SGT). In Buddhist philosophy the Buddha exhorts “Awake, be the witness of your thoughts”.

On Task / Off Task Attention, Mind Wandering, Working Memory

In this section we compare the concept of attention as used in Cognitive Science, Indian philosophy, and its relation with meta-awareness. In our attempt to do a comparative analysis of MW, mindfulness, intentionality from the disciplinary perspectives of cognitive phenomenology, cognitive psychology, and Indian philosophy, we try to clarify terminologies used by the following means: i) providing English translations, ii) clarifying similarity and differences in semantics, iii) explicitly clarifying critical distinctions between personal agent level processes vs. sub-personal processes. Given the subtle differences between IMW, and UMW; automatic (sub-personal thoughts) vs. controlled thoughts, we will explicitly specify claims of intentionality and meta-awareness where necessary, in order to minimize ambiguity. Attention is like a selective filter (Broadbent 1964) which selects some subset of available stimuli (external, or internal memories) for further conscious processing. Attentional focus has its dynamics and can shift from “on-task attention” to “off-task attention”, and vice versa. The

shift of attention from “on task” to “off task” may happen in different ways. The shift of attention can be ‘automatic’ or ‘controlled’; ‘intentional’ or ‘unintentional’ (Seli, Risko, Schacter, 2015). Empirical studies have shown sudden unintentional MW, during its initial occurrence, is not accompanied by meta-awareness. This aspect of UMW is observed more frequently in clinical populations like ADHD, OCD (Seli, Risko, Smilek, 2016) which suggests its role in certain psycho-pathologies. The automatic unintentional character of initiation of UMW (e.g. automatic negative thoughts) suggests sub-personal process, lacking in;

- i) phenomenological experience of sense of agency,
- ii) purposive goal directedness (intentional character)
- iii) meta-awareness.

UMW may be said to lack attentional agency, and veto-autonomy (Metzinger 2013) e.g. people suffering from depression often experience automatic negative thoughts (e.g. I am no good, this is too tough- I will fail), considered to be cognitive distortions, which are not experienced as being consciously willed (Wegner 2002). Shifts of attention from on-task to off-task which characterizes MW can be intentional/ deliberate, or unintentional/ spontaneous. While further detailed empirical studies are called for, our theoretical analysis may suggest some directions that UMW is associated with executive control failure, and/or automatic shifts of attention away from task at hand (set shifting) which occurs frequently in conditions such as attention deficit, OCD. IMW, in contrast is associated with a sense of agency, meta-awareness of shift of attention away from the task at hand (Seli, Risko, 2017). Experimental studies found correlation between higher working memory capacity, lower cognitive task load, and higher rates of IMW (Forster, Lavie 2009)

The relationship of Mindfulness, and mind-wandering appears complicated, leading to various accounts, some of which are mutually inconsistent (Mrazek, Smallwood, Schooler 2012). Is Mindfulness “always” good, and Mind Wandering always costly distractions? Or is the relationship more subtle, nuanced, depending on the population being studied, and the context under consideration?

Given the premise that attention is a limited resource, *prima-facie* it seems like off-task/ SGT, and on-task are opposing constructs of an ongoing dialectic process. On-Task attention, and off-task attention being negatively correlated we intuitively think they are mutually exclusive in nature (Mrazek, Smallwood, Schooler 2012). Our analysis suggests that the above views are over-simplified, because there exists partial similarities between Mindfulness, and Mind-wandering. On-task attention, and off-task MW, are not necessarily discrete episodes that are mutually exclusive. We suggest that MW episodes can vary in intensity, and duration because of which attentional resources are divided between on-task, and off-task. In terms of adaptive value, and costs MW, need not be considered to be distraction at best and disturbance at worst. We focus on the distinction between IMW and UMW while stating that IMW can serve adaptive

purposes, e.g. foreseeing future possibilities, creative imagination (SGT, Counterfactual thinking, Thought experiments)

The function of MW depends as forementioned on the specific population and context e.g. UMW associated with negative memories observed in the population with diagnosed depression, contributes to relatively longer duration of depressive episodes (Hoeksma, N. 1991). We apply the important distinction between IMW, UMW, which has been developed by (Seli, Risko et al., 2016) by relating them to other cognitive processes e.g. components of attention, meta-awareness. Phenomenologically IMW episodes have been associated with experience of Meta-awareness, intention, (w.r.t. purpose, & agency). In terms of Cognitive Phenomenology, IMW is associated with deliberate shift of attention, higher working memory capacity, sense of agency and control in the sense of capacity to direct/ shift current episodes of IMW. It is suggested that meta-awareness is present in IMW (Schooler, J., 2011), whereas in contrast meta-awareness is mostly absent, at least in initial phase of UM, where Attentional Agency, & Veto Autonomy are absent (Metzinger 2014)

The dynamics of Intentional and Unintentional Mindwandering

Now we attempt to analyze relations between dynamics of attention with IMW/UMW. Much of previous literature does not make clear and consistent distinction between IMW, and UMW (Seli P, Risko, Smilek D., Schacter 2015) UMW which more often occurs under high cognitive load task conditions is hypothesized to involve “executive control failure” (McVay, Kane 2010). Executive failure involves failure to maintain attention on the current task which requires top-down inhibitory control of attention. Executive failure to maintain on-task attention leads to “Perceptual Decoupling” (Smallwood, Schooler 2011) and sudden automatic shifts of attention (e.g. in attention deficit disorder, anxiety disorders) which is not consistent with the subjects intentions (and is involuntary). Usually later on in the (unintentional) Mind Wandering episode, meta-awareness occurs which indicates that the mind has wandered away from the current task, and attention may be re-focussed back on the current task. Close inter-relation between attentional processes and working memory is emphasized, which connects with ‘memory’ within Cognitive psychology and ‘sati’ as memory in Sammasati / Mindfulness. Current contents of attentional focus is determined by contents of working memory which are aspects of the broad category of executive functions. Given the diversity of theoretical terms in literature (SAS- Supervisory Attentional system, WM - working memory), we try to use systematic cognitive ontology (Poldrack, Kittur, Kalar et al. 2011). Contents of MW episodes involve shifts of attention away from the current task at hand, and switch in contents of WM. IMW in contrast, involves voluntary controlled shifts of attention away from the current task at hand, which is consistent with one’s intentions directed towards one's goals accompanied by meta-awareness.

Attentional Control, Perceptual Decoupling, Working Memory

The process of MW is importantly dependent upon attentional shifts (perceptual decoupling) and changes in current contents of working memory. WM is the cognitive mechanism responsible for holding the mental representations needed for an ongoing cognitive task (Oberauer 2019).

Executive attention is closely related and similar to certain aspects of working memory, both of which are involved in determining objects currently attended to (external stimuli and/or internal memories), and in regulation (shift) of attention (controlled attention, vs automatic attention)

IMW is postulated to involve top-down controlled attention regulation consistent with the subjects intentions, and accompanied by meta-awareness. UMW by contrast is postulated to involve “automatic” (unaware) shifts in attention, accompanied by executive control failure during “perceptual decoupling”. Phenomenologically UMW may be self detected at some later point of time, then meta-awareness “activates”, and (thus) is experienced as unintentional i.e. contrary to the subject's purpose. UMW often involves a sudden shift in attention and current “mental representations” (active in WM) associated with mental time -travel (Tulving 2002).

Metzinger (2014) has suggested that during (spontaneous) UMW attention shifts to some version of Self Model (termed- Phenomenal Self Model) situated at some point in time (other than the present, i.e. in the past, or future) involving change in representational context of self. During UMW which is retrospective, one may virtually relive certain experiences from the past as if one were transported into some self model in the past. Thus Mind wandering can be interpreted as virtual mental time travel, in which virtual temporal self location shifts away from the present. This shift during MW, can be intentional or unintentional, with or without meta-awareness. To clarify using a specific example based on real case data, let us consider Mr.sad. When Mr. sad feels predictably low/ sad on being reprimanded by his supervisor, owing to associatively linked memories and mood dependent recall (Bower 1981), he may unintentionally experience UMW where there is virtual mental time travel to his past self when he was similarly scolded. This UMW which is retrospective, and negatively valenced tends to depress his mood further if he is unable to de-fuse from contents of retrospective mind-wandering using meta-awareness of the present. Can we suggest a path (“magga”) to Mr.sad so that he learns how to become like a self-contained “be ye islands unto yourselves, be ye a refuge unto yourselves, seek not for refuge in others” (Mahathera 1982). For the same we later analyse psychological tools, techniques to reduce UMW, and associated negative emotions- namely Mindful Meta-awareness, and Intentionally Induced Positive Self Generated Thoughts (Pratipaksha Bhāvanā, Patanjali Yoga sutras). Working Memory which is also involved in Mind Wandering, “selects” inputs from sensory perception, or long term memory (particularly - episodic memory), interacting with attentional mechanisms. Meta-awareness related to witness consciousness (Sākṣī) which is the main characteristic of mindfulness practices, helps in de-fusing from contents of mind-wandering, which are not, then, accepted at their face value, leading to reduction in

associated emotional distress. One basic technique to develop present focussed awareness is suggested by Buddhist tradition- focus one's attention on one's breathing (Anāpāna Sati). This technique may restrict working memory to the present awareness by coupling it to, attention on the basic biological process of breathing.

Mapping Meditative Practises onto Indian counterparts

Meditative practises (M.P.) are generally classified into three categories - Focussed Attention Meditation (FAM), Open Monitoring meditation (OMM), and Loving Kindness Meditation (LKM). We have seen the role of attention and complementary relationship between on-task and on-task cognitive processes. Given this role of attention, we attempt to classify the cognitive processes of MW, and MP according to dynamics of attention. We introduce some key terminology used in contemplative practises within Indian philosophy. We suggest mapping the terms used in contemplative practises onto the terms used in Cognitive science/ Cognitive phenomenology. This mapping suggests the co-extensive nature of the concepts and lends better grip over them in practical engagements.

Mapping Focussed Attention Meditation onto Dhyana Meditation

As per the earlier classification of MP, within FAM when thoughts are deliberately anchored on external, or internal foci we call it FAM. For the cessation of hindrances towards yoga one is prescribed to practice focussing on one principle (tat pratiṣedhārtham eka tattva abhyās PYS 1.32). This principle could be anything, the only condition being the attention should be focussed single pointedly. While a list of hindrances is given in the PYS 3.30. The practice of Dhyana is defined as the uninterrupted flow of mentations towards one object (tatra pratyaya ektāntā dhyānam PYS 3.2) e.g. In the practise of Trataka one focusses visual attention on a specific point for a long time (usually without blinking). One can optionally practice meditation according to specific culture on the concept of God (Ishwar Pranidhānād vā PYS 1.23). The symbolic practice of chanting Om (Tasya Vāchakh pranavah PYS 1.27) is also prescribed to focus attention on the utterance.

Mapping Open Monitoring Meditation onto Sammasati and Sākṣī bhava

The meditative practises like contemplation witness consciousness - Sākṣī bhāva (Sharma, M. 2020) and mindfulness (Sammāsati). The witness consciousness is the unperturbed consciousness, which bears witness to the flow of mentations. Mindfulness is non-reactive (ātapī) , conscious observation (Sampajāno), direct experience (Paccānubhoti) of the origin and passing away (Samudaya- vaya dhamma) of four categories viz. body (kāyā) sensations (vedanā), mind (citta), content/ truth (dhamma) is called as Sammasati ("Mahasatipatthana Sutta

- The Great Discourse on the Establishing of Awareness", 2020). When one observes the thoughts without any judgments, without identifying oneself with the thoughts, we call it O.M.M. The meditative practices of Sākṣī bhava (witness attitude) prescribes the meditator to observe the flow of thoughts as the witness without any attachment, or judgment. The Satipatthāna Sutta prescribes four types of Vipāśana (conscious observation) practises as mentioned earlier. In the ups and downs of life it is only inevitable that emotional turmoils will be created. The individual in such a state of emotional turmoil fuses (Vṛitti Sārupyam Itaratra) with these states i.e. the witness of mentations (dṛṣṭā) takes the same form as that of the mentations. The individual here conceived as witness consciousness (Sākṣī) fuses mentations. In the practise of sākṣī bhāva (witness attitude) the individual distinguishes oneself through discernment (viveka) from the passing by mentations. The fusion (sārupyam) thus defuses, in this practise leading to equanimity. Thus, the concept of Sākṣī Bhāva maps onto the concept of de-fusion.

Generalizing Loving Kindness Meditation to Virtuous Attitude Cultivating Meditation

The third type of meditative practice viz. Loving Kindness Meditation (LKM) is suggested to be generalized as Virtuous Attitude Cultivating Meditation (VACuM). In LKM the attitude of love, and kindness, which are culturally prominent in Christianity also ("Thou shalt love thy neighbour as thyself" (Bible, King James Version, Matthew 22: 39), and Buddhism, is practised. Attitudes, beliefs, mental states influence perception, understanding, and behavioural response. In the practice of VACuM subjects try to develop virtuous/ wholesome states of mind. The concept of virtue/ wholesomeness may be related to the concept of Samyakata (proper) used in Buddhism e.g. in the eight limbed Atthangika magga - Samyaka Ditthi, Samyaka Manasa, Samyaka Samadhi etc. as well as the concept of cardinal virtues in Greek tradition (temperance, prudence, courage, justice).

How to cultivate VACuM ? In the practice of VACuM specific states of mind/ attitudes are induced intentionally reflectively by experiencing them within one's mental space using imagination, affirmations, visualization, and associated feelings. e.g. to induce a socially virtuous state of mind characterized by friendliness, empathy, compassion, successively for oneself, for a neutral person, for one's enemy, and finally for all sentient creatures. LKM initially should be developed only towards oneself, doing it repeatedly thus: "May I be happy and free from suffering" or "May I keep myself free from enmity, affliction and anxiety, and live happily." In Buddhist tradition also we find "Pīti"- "karuṇā" which are universally accepted as positive and socially desirable attitudes. Virtuous / wholesome attitudes like loving- kindness is one specific instance of virtuous attitudes.

Recognizing the diversity of virtuous attitudes, and applying abstraction, generalization, it is suggested that LKM can be generalized to Virtuous Attitude Cultivating Meditations

(VACuM). We briefly examine the original literature associated with virtuous attitudes from at least two traditions- Buddhist, and Yoga traditions. VACuM, as a generalized method, - Metta (loving-kindness), karuṇā (compassion), Muditā (gladness), Upekkha (equanimity), can be specifically used to develop four different virtuous attitudes known as Brahma Viharas. Another extended list of virtuous attitudes is given in Daśa Pāramis (Miller, B. S. 1979).

We find conceptual similarities between Patanjali Yoga sutra (Sutra 33), and the Buddhist Brahma Viharas. The major focus is on cultivating virtuous qualities of the mind that are conducive to mental peace. The Patanjali Yoga Sutra 33 states that, friendship, mercy/compassion, gladness, indifference, being thought of in regard to subjects, happy, unhappy (**maitrī karuṇā Muditā upekṣhanām sukha duḥkha punya apunya vishayānām Bhāvanāt: Citta prasādanam**) good and evil respectively, pacify the Mind (Citta). [We propose that one of the important applications of the generalized category of VACuM is the intentional cultivation of Induced Opposing Balancing Attitudes (Patanjali yoga sutra 2.33 **vitarka bādhane pratipaksha Bhāvanam**). This helps in reducing the impact of unwholesome psychological states (e.g. rage, revengefulness, hatred) which is directly related to the concept of Patanjali yoga sutra 2.33 as mentioned above. Often times, due to one's temperament or life's experiences, one may develop an inclination towards negative mental states (associated with Automatic Negative Thoughts), which leads to distress- e.g. fear, anxiety, anger. Consistent cultivation of virtuous induced opposing states of mind - e.g. calmness, hope, courage ; understanding, empathy, co-operation, if conjoined with appropriate adaptive practical behaviours, may help in stabilizing the mind and, in the long run, developing the personality. So according to Patanjali yoga sutra 2.33 in order to avoid thoughts which are non-conducive to well-being one needs to cultivate the opposing balancing conducive thoughts. Thus, we suggest that love and kindness are two instances of attitudes which can be generalized to the cultivation of many other virtuous attitudes which are fruitful according to the given context of culture, stage of life, stressors as assessed by the individual or the counsellor.

Conclusion and Summary

The relation of on-task and off-task attention is suggested to be of complementary nature rather than opposing. The interpretation of MW as involving perceptual decoupling, shift of attention away from current tasks, and therefore a costly distraction, does not take into account the finer differences between the types of MW. Given the IMW and UMW classification a nuanced understanding of the phenomena of MW presents us with the adaptive dimensions of MW which include creative imagination, foreseeing future possibilities etc. In the section of mapping MP onto Indian counterparts we suggested that MP of FAM maps onto Dhyana meditation. OMM which includes Mindfulness practise maps onto the concepts of Sammasati and Sākṣī bhava. Both IMW, and Mindfulness may share the quality of Meta-awareness. In the final section we generalized the third MP of LKM to VACuM.

N.B - Both authors have equal contribution and credit, hence both are first co-authors.

Abbreviations

MW - Mind Wandering, IMW - Intentional Mind Wandering, UMW - Unintentional Mind Wandering, FAM - Focussed Attention Meditation, OMM - Open Monitoring Meditation, LKM - Loving Kindness Meditation, MP - Meditative Practises, VACuM - Virtuous Attitude Cultivating Meditation, SGT- Self Generated Thought , PYS - Patanjali Yoga Sutras

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