

Preliminary yoga therapy experiments testing the impact of self-awareness on interoception

Yoko Kamada

Toyo University Graduate School of Information Sciences and Arts, Japan, Email: s3b101800056@toyo.jp

The world yoga population is increasing. Many meta-analyzed papers on the effects of yoga and of mindfulness-based yoga have been published. According to Kanbara and Fukunagas, (2016) hypothesis, the foundation of physical self-awareness is receiving interoception, which mainly involves the anterior insular cortex (part of the cerebral cortex) and the cingulate gyrus (part of the limbic system) and is implicated in the regulation of the autonomic nervous system. In biofeedback therapy, this is where homeostasis is based. We hypothesize that the same applies to yoga therapy. We plan to prepare a program that allows becoming very aware of intraception and to prove its effectiveness. This experiment, as a preliminary step, verifies whether the program in itself is effective. Subjects concentrate their awareness regarding their interoceptive feelings of now, here, this moment. Their objectivity is enhanced doing isometric yoga exercises, a trademark of Japan Yoga Therapy Society, which alternately tenses and relaxes muscles. Matching ones breathing with movements enables us to understand the changes during and after exercise. The 30-minute program includes body scan, meditation and breathing exercises. The experiment was conducted on 14 yoga therapy students aged 38 to 74, whose consent was obtained. An abbreviated version of POMS 2 was used and a physical symptom record table before and after practical sessions was completed. No adverse effects were caused by the subjects. POMS 2 indicated a significant reduction of negative feelings and improved physical symptoms, therefore a significant difference was observed. It was recognized that this program encourages selfawareness and the objective of interoceptive sensations is that they influence emotions. In the future, to verify the impact of objectivity and self-awareness, experiments will be conducted with a control group which will not be encouraged to become self-aware and objective.

Interoception is an iterative process, requiring the interplay between perception of body states and cognitive appraisal of these states to inform response selection. Afferent sensory signals continuously interact with higher order cognitive representations of goals, history, and environment, informing emotional experience and motivating regulatory behavior. Together, these iterations create a sense of self laden with motivational context.

One reason that interoception, a perceptual capacity, is introduced in reference to well-being is that it's thought to be intimately connected to self-regulation, having likely evolved to assist organisms maintain homeostasis . In modern life, emotionally valenced body signals also are thought to

contribute to broader mood states that support emotional balance. To the extent that an individual is sensitive to interoceptive signals, such signals guide deciding (Dunn et al., 2010). And yet, high sensitivity isn't without its price: when body sensation is irregular, as for people with joint hypermobility, greater interoceptive sensation can also contribute to feelings of hysteria . Thus, interoceptive sensitivity may either contribute or detract from well-being, suggesting a requirement for guidance in regulating salient visceral signals.

Paralleling the findings of recent secular clinical science, contemplative science suggests that reflection on interoceptive processes is vital for adaptive behavior disrupting overlearned perceptual, and interpretive habits formed throughout cognitive development and aligning behavior with higher-order intentions . because the embodied self is more fully realized through awareness of ongoing interoceptive interactions, two complimentary senses emerge: presence, one's connection to the instant , and agency, one's ability to effect change, which are both foundational in determining a person's sense of well-being.

Acknowledgment of interoception's multimodal and multifaceted nature is important, because consideration of these factors in isolation can lead to spurious inferences. For example, knowledge that meditators have strong interoceptive attention tendencies might lead one to expect them also to possess superior accuracy in heartbeat detection, an idea contradicted by recent research on this topic The benefits of interoceptive attention in a particular domain such as breath or body monitoring therefore seem to be independent from a domain-general enhancement of interoceptive accuracy. Instead, meditation practices appears to promote changes in a more specific subset of interoceptive capacities and tendencies, accompanied by non-interoceptive factors such as changes in intentions or goal-orientations unique to each system of practice. Asian classical traditions have a rich history of describing the integration of varied interoceptive signals into a common representation, a phenomenon often referred to as the 'subtle body' (Samuel, 2008; Klein, 2013). The subtlety of this body has to do with its typically functioning outside the horizon of ordinary consciousness.

If an ice cube's value is deeply influenced by allostatic concerns, a complete model of interoception must describe how such influence comes about. While acknowledging that many physiological perturbations are addressed unconsciously, through autonomic control of the internal milieu, conscious



regulatory acts seem structured to resolve interactions between the body and its external environment. In this way, interoceptive signals motivate overt behavior that feeds back upon our physiology. It is also important to note that not all motivated behavior is allostatic: hedonic and pragmatic goals also have a large role to play, such as sensation-seeking to distract or regulate low mood, or self-caffeinating in the face of fatigue. One approach to understanding dysfunctions in interoceptive awareness is to apply the predictive coding framework as an explanatory model distinguishing adaptive and maladaptive processing. In the metacognitive space that is afforded by enhanced non-reactivity, multiple interoceptive appraisals may be observed as arising and passing. While perceptual inference, by definition, precludes immediate cognitive elaboration on sensation, in the long term, a greater corpus of interoceptive information provides a richer set of data from which to investigate habitual sources of interoceptive perturbation, to identify the relationship between inner somatic experience and cognitive experience, and one's internal responses to outside events and stimuli. Interoception has in many ways been a hidden sense, perhaps due to the challenges involved in measuring and manipulating interoceptive signals. And yet, interoception is arguably at least as important as the external senses, providing a sense of embodiment in the world that is foundational to a person's subjective sense of well-being.