CHANGES IN PERCEPTION FOLLOWING YOGA PRACTICE

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Perception is sensation with added complexity due to factors such as memories and emotions. Yoga practice influences perception in three ways: (1) by increasing perceptual sensitivity, (2) by selectively `shutting out' undesirable stimuli, and (3) by changing distorted perception, which occurs in schizophrenia. Practicing yoga improved auditory and visual perception, by increasing sensitivity to various characteristics of the stimuli (e.g., intensity, frequency). Also, electrophysiological studies using evoked potentials have shown that during yoga practice the transmission of sensory information is facilitated. These studies suggest several applications of yoga practice, in activities ranging from aviation to art. Interestingly, other studies suggest that yoga practice can also help to `shut off' undesirable external stimuli, which is possibly due to cortical feedback connections to the sensory pathway. It is also possible that through changes in cognitive factors yoga influences perception, so that even though the stimulus is `sensed' it is not disturbing. This concept has been studied using yoga to help persons with chronic pain to willfully ignore it. Finally, preliminary studies have shown that yoga practice may modify distorted perception in conditions such as schizophrenia. Hence, there is sufficient research to support the idea that yoga practice influences perception in different ways, with varied applications.

Perception is the process of interpretation, organization, and elaborating the `raw materials' of sensation (1). Sensation involves sensory receptors and pathways, whereas perception is a cognitive process. The actual perception of a sensation depends on factors such as what has been learned, memories, and emotions. It is also important to remember that while perception usually refers to sensory stimuli, this definition can be extended to include the perception of situations.
Recordings of middle latency auditory evoked potentials (AEP−MLRs) have shown that the practice of ujjayi pranayama modifies the AEP−MLRs components in two ways. A specific component (the Na wave) has reduced latency and increased amplitude during pranayama practice (2). These results suggest that this practice facilitates the processing of auditory information at mesencephalic and diencephalic levels. A similar result was also seen during the practice of meditation on the syllable Om (3), where subjects who had more than ten years of meditation experience, showed an increase in the

Na wave amplitude and a decrease in its' latency while mentally repeating (Om). No such effect was seen when the same subjects mentally repeated `one', during a control session, for comparison.
These electrophysiological data are corroborated by neuropsychological studies. Previous studies on meditation have shown significant changes in perception, attention and cognition (4). Brown and Engler in 1980 (5), reported that meditators were found to be more sensitive to subtle aspects of color and shading of the Rorschach test inkblots, than they had been before meditation. Two studies on the Critical Flicker Fusion Frequency have shown that perceptual sensitivity is not restricted to subtle aspects of the stimulus alone, as detection of a high frequency flickering stimulus was found to improve following yoga training (6,7). A study on the degree of a visual geometric illusion, based on Müller−Lyer lines showed that a combination of focusing and defocusing yoga visual exercises reduces optical illusion more than focusing alone (8). These studies were conducted on adult subjects with varying durations of yoga training. It was reported in a recent study on Critical Flicker Fusion Frequency and optical illusion on children who practiced yoga for a shorter duration of 10 days that there was also a

significant improvement following the practice of yoga (9). To perceive an optical illusion with minimal error and for accurate depth perception the spatial component of visual perception is necessary (10). The decrease in the degree of optical illusion perceived over a short period would be mainly due to cognitive judgmental factors, but not retinal or cortical factors as generally understood (11). The cognitive judgmental factors involve the way in which the subject interprets incoming visual information based on experience, hypothesis and strategies of judgment. Hence the training through yoga to focus and defocus might have influenced the cognitive judgmental factors of the subjects, to significantly reduce the degree of optical illusion perceived. Critical flicker fusion frequency (CFF), on the other hand, assesses the temporal component of perception of a visual stimulus (12). The increase in CFF following yoga could be attributed to the effects of yoga reducing physiological signs of stress, as CFF was found to be lower during specific stressors, such as food and water deprivation (13). This showed that both spatial and temporal components of visual perception are modified following yoga practices. Hence the electrophysiological data as well as the visual, neuropsychological studies cited above have shown that yoga practice improves diverse aspects of auditory and visual stimuli in normal volunteers.
An interesting difference in auditory perception (based on AEP−MLRs) were also seen in congenitally blind children (14) and adults (15) compared to those with normal sight. The changes suggested improved auditory perception which could be a compensatory mechanism of auditory sensation in the presence of poor vision.
The effect of yoga has been observed on the perception of situations. Examples of a change in the way persons perceive situations was observed in two separate groups of subjects. A study on 69 aged persons (above 60 years of age), staying in an old age home, showed that after 6 months of yoga practice there was a reduction in their feelings of depression, based on the Geriatric Depression Scale suggesting a favorable change in the wy they perceived their circumstances (16). Another study on ten patients with breast cancer (stage 2 and 3), showed reduction in depression and anxiety (using Beck's Depression Scale, Spielberger's State and Trait Anxiety Inventory), after practicing yoga for 6 months. Hence yoga can probably have positive effects on both sensory perception and on the way situations or circumstances are perceived (17).
Finally, there may be more ways of perceiving the world than we know about. As the renowned sensory neurophysiologist, Vernon B. Mountacastle said: "Each of us lives within.....the prison of his own brain. Projecting from it are millions of fragile sensory nerve fibers, in groups uniquely adapted to

sample the energetic states of the world around us: heat, light, force, and chemical composition. That is all we ever know of it directly; all else is logical inference" (18). Yoga may allow an advanced practitioner to develop `siddhis' or special powers, which may hence allow such a person to have a different, possibly `expanded' perception of the world.

I am a Doctor, doing my Ph.D.in Yoga. My topic of interest is to conduct Yoga Retreat, take class for Yoga Teacher and Medical professionals for in depth Research findings, and also Interest to conduct research in various field of yoga, both experimental and theoretical. I have been Traveling to all EUROPIAN countries.My contact: yoga4all@india.comMy web page:http://www.geocities.com/manojrieneke/Research.html

Alternatively Endo

By Tammy Majchrzak

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Yoga and Endo:

Yoga brings great benefits to anyone wishing to practice. It can be especially beneficial for those who, like me, have Endometriosis. I have found through regular practice that Yoga helps to bring clarity of mind, focus and stability. It is through this stability and grounding that we begin to look at our body and this this disease in a new light. Postures that work on energising, waking, twisting and turning internal organs, releasing toxins, working the nerves, muscles, every part of every part of you begins a workout and greatly benefits. The beauty of Yoga is that it starts working from the moment you practice. Benefits are felt almost immediately.

"How can i do this when in such pain" − The key is to start small with gentle stretches to energise and wake up the body. for many it will be introducing the body to exercise again, in a gentle form. As you become more flexible and willing to practice you can move on to shall we say bigger postures that work to rebuild muscle, tone the body from inside out. Yoga is your personal journey and I personally feel it is a most valuable tool for not only those with Endometriosis but for anyone who wants to unite mind, body and spirit.

Qualified Yoga Practitioner and spiritual healer. Great interest in Alternative therapies, diet and nutrition, yoga, healing, meditation etc. Currently working to generate awareness of how alternatives can assist those with Endometriosis, through diet and nutrition, exercise and alternative ways of living we can help to manage this disease.