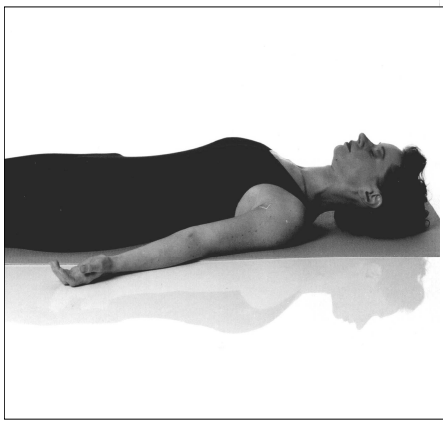
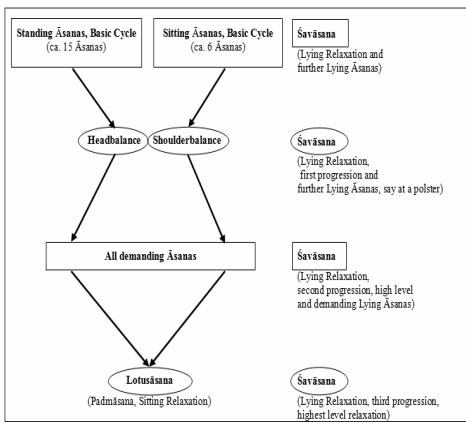


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The Relaxation Process in the Perspective of Yoga



Festschrift for the twentieth Jubilee of the Yoga Forum München e.V.

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Yoga Forum München e.V., Steinstraße 42, 81667 München, © Authors 2010

Photos: Andreas Pohlmann, Model: Ingrid Bräuer-Gipp,
Translation: Louise Cyffka, Graphics: Katharina Strunk,
Editor: Christine Stecher,



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Yoga Forum München e.V.**

(Unedited unshortened version of the article published in the
Journal *Psychodynamische Psychotherapie* 2010, Vol. 9 No. 2,
Thematic priority »Relaxation«, Schattauer Verlag Stuttgart,
Germany, with permission of the publisher)

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Published by Yoga Forum München e.V



Yoga – a Relaxation Technique

The fact that relaxation is mentioned in close connection with yoga, and that yoga is recognized and studied/researched as a relaxation method in India¹ and Europe² shows that this is a central concept. Obstacles to both the everyday and the scientific understanding of relaxation, however, consist in the fact that the concepts of relaxation and yoga are either not defined clearly, systematically or according to a standard, or at least are not used in a uniform way. This is further complicated by the fact that the relaxation experience is a non-verbal phenomenon. The use of the specialized Sanskrit terms in yoga on the one hand, and the western scientific usage of German or English on the other, poses a further obstacle.

Structure of the Yogic Objective of Relaxation

There must be hardly anyone who has absolutely no idea of what relaxation is. However, to believe that everyone means the same thing when speaking of relaxation would be simplistic. During a panel discussion Podak, the managing editor of the *Süddeutsche Zeitung*, asked van de Wetering, author and expert for a traditional Asian relaxation method, why one cannot just as well lie on the sofa as sit in the lotus posture – a provocative question for the audience in order to illustrate the difference. Is lying on the sofa equivalent to relaxation in the sense of yoga, or this only possible when sitting in the lotus position? According to older editions of the Brockhaus encyclopaedia, however, it is basically a matter of contorting oneself to get into the lotus position, or: »that causes pain and wrecks havoc with the knee-joints« – as many have already observed or imagined.

¹ One of the first was Prof. K.N. Udupa, Director of the Medical Institute in Benares with his research on *Disorders of Stress and their management by Yoga*, Varanasi, 1978

² cf. among other things, Th. von Uexküll: *Lehrbuch der Psychosomatischen Medizin* (Textbook of Psychosomatic Medicine, Munich, 1991/2, p. 417, 1996/5, p. 765 in connection with hypertension).

Just what is so fascinating about this lotus posture, padmāsana (from the Sanskrit, *padma*, »lotus« and *āsana*, »sitting«)³, the most significant yoga position, that it not only finds worldwide recognition today, but that a leading automobile company in India can even advertise one of their car models with the words: »Driving this car is as relaxing as relaxed as sitting in the lotus position«? Is relaxation, therefore, sitting in the lotus position or lying on one's back in what is termed par excellence the relaxation posture of yoga, the śavāsana (from the Sanskrit *śava*, »corpse/dead man«,⁴ *āsana*, »sitting, position«)? Does it refer to the act of sitting still or lying still in itself, or is this thinking too much in terms of the bodily aspect? Is it the intention of »doing nothing«, the mental/emotional quieting, which brings calm and relaxation? Is it the individual experience shared with others in the group? Is it the personal experience which can be classed as a link with the reflected experiences from the yoga tradition? Is it the mental-emotional component, e.g., one's own competence and the feeling of encouragement which stems from being able to actively contribute to one's own well-being? – Most likely it is all of these aspects taken together.

³ *Āsana*, »sitting, sitting down, a special position, the place on the elephant where the steering wheel is«. This comes from the verbal root √ās, »to sit calmly, be present, be on the spot, exist serious, corresponding to the correct form, to do something continuously without interruption / to remain in the situation«. As a collective term we here use the word *Āsana* (posture) also for *prāṇāyāma* (*prāṇa* / the regulation of breathing), *pratyāhāra* (the calm stimulation of the senses) and *dhāraṇā* (concentration/attentiveness) as well as *dhyāna* and *samādhi* (the results of relaxation/yogic processes).

⁴ From the verbal root √śu / √śvi, »to swell, to become strong, grow, increase, like an energy-laden, swollen river«; an image for the increased strength / activity of the inward nature (the increased flow of the life force) which can be observed in the *Āsana*, in which one's attentiveness is opened to perceive the dynamics of nature. The strength of the *prakṛti*, which is located particularly at the *marmas*, can manifest. Stabilisation becomes possible, and *vata* is able to carry out the appropriate actions, e.g. to breathe freely.

The salutogenic and medical Aspects of Yoga

A large discrepancy often exists between what is referred to as the etic perspective (i.e. the extrinsic, or »outsider's« viewpoint) and the emic perspective (the intrinsic, or »insider's« viewpoint). Both of these play an important part. The current status of yoga research is here continued in the form of physiological, neurological and attention-related research as well as research on yogic concepts.

Seen from the outside, yoga is an activity which places great emphasis on the body, and sometimes even includes an acrobatic component. Thus the correct »posture« (*āsana*) appears to be the ultimate goal; consequently, yoga is a suitable method for promoting physical flexibility and balance as well as increasing strength and stamina.

Who can benefit from yoga? As a method of practice, yoga apparently accommodates people who do not particularly enjoy outdoor sporting activities, and who are reluctant to exercise. Yoga is commonly considered to serve the purpose of relaxation in stress situations.

The Status of Research

Research in connection with yoga started at the beginning of the previous century. Chandra gives an overview of the first beginnings of research. He observes the reduction of high blood pressure by means of inner attentiveness and rhythmic breathing in the śavāsana position by Datey in Bombay (1969) and in Croydon, England (1973, 1975). Patel's control group rested on a couch, which had no effect on blood pressure. Benson (1974) led a relaxation concentration session in which he told the participants sitting on the floor or on a chair in the lotus position to relax their muscles and to observe their breathing through the nose. They were asked to silently say to themselves »one« while breathing in, not to let themselves be distracted by any interrupting thoughts, and to take on a passive inner attitude which allows relaxation to take place. He thought that an external biofeedback stimulus would only disturb the relaxation. Benson called this reaction, which is opposed to stress, the relaxation response. Ebert (1986) summarises this state – according

to an overview of the physiological aspects of yoga – as a cortical state of wakefulness with simultaneous motor relaxation and a trophotropic vegetative state with de-automatised consciousness. In further studies the traditional yogic teaching of muscular practice was confirmed (»relaxing into the yoga pose«) combined with the observation of one's breathing while breathing freely, the reduction of the concentrative effort of relaxation (»The reduction of the necessary concentrative effort«, *Yoga-Sūtrani* II, 46-48, in which the āsana is defined)⁵ and inner wakefulness (cf. Vaitl 2009). Improvements in the concept of self as well as better emotional adjustment were furthermore observed by researchers.

The question of the benefit of yoga is a topic which has also been of interest to the Department of Health of the USA. An analysis of the evidence pertaining to yoga (and other body-mind methods) was commissioned under the keyword »meditation«. This mega meta-analysis took into account 813 studies performed between 1956 and 2005 and was published in June 2007 (Ospina et. al.). This critical analysis concluded that there is a need for more evidence. The reasons given in the report were weaknesses in research methodology. In particular it remained unclear what exactly was practiced. There was criticism with regard to the inadequate description of the exercises and the corresponding practical instructions. Further points of criticism concerned the lacking clarification of and/or the unclear definition of the theoretical perspectives and concepts. The necessity for process and outcome research was emphasised.

Later studies no longer demonstrate some of these weaknesses, and explicitly document various specific effects of yoga. Sherman et. al. (2005) shows, for instance, the superiority of yoga in comparison to

⁵ *sthira-sukham āsanam*, »stable and pleasant is an āsanam (stable processes which proceed smoothly, and which produce a sphere of experience which has become pleasant and conducive to well-being, are called Āsanam)«; YS II. 46
prayatna-saithilya-ananta-samāpattibhyām» (brought to being) through reduction of effort and unending attentiveness«; YS II. 47
tato dvandva-anabhigātaḥ, »from this results the state of not being attacked strongly by pairs of opposites such as hot – cold, pleasant – unpleasant«. YS II. 48

physiotherapy in the case of chronic lower back pain. Ali (2007) confirms that yoga is the most effective of the mind-body therapies in the case of hypertension. Schultz (2007) finds that yoga strengthens the immune system of breast cancer patients. As a result of meditation, to which yoga is also classed as belonging, neuronal alterations are reported in the prefrontal and cingulate cortex areas (according to Vaitl 2009).

How is a medical Research conducted on a specific »Medication«?

- What is a medicine? – A substance / health remedy with a clear indication of the contents and instructions for use.
- How does it act in the body? – It produces effects.
- How does it do this? – With mechanisms of action.
- What is the dosage? – That means how much should be taken, and how often.
- How can it be used safely? – That means what are the side effects and contraindications.
- How can the quality of the »medicine« be ensured over time? – By means of quality assurance.

Can yoga be defined as a type of health procedure and a medicine, and how does it work?

In order to give our working hypotheses a scientific basis, it is important to include the yogic philosophy in the equation. Yoga is considered in the oldest source of Āyurveda (around 2000 years ago), in the text of the author Caraka, to be a means and a procedure (*auśadha*)⁶ for stimulating health (Bögle, Lüthi 2000). Medicines are considered to be a remedy for illness.

⁶ from sanskr. *auśadha* probably from *oṣa* + *dhi*, »to be aware over«.

The central Concept of »Yoga Relaxation«:

Citta-Vṛtti-Nirodha

Yoga is defined in the first and most meaningful text on yoga, put into words two thousand years ago – the yoga sūtras – conceived for the teaching/learning situation and originally passed on interactively by word of mouth from teacher to learner.

The sutra style of the text explains the central definitions of yoga in short, formula-like phrases at the beginning, which are then explained in more detail later the text: namely citta vṛtti nirodha.

Nirodha (Sanskrit *ni*, »into«, and the verbal root *rudh*, »to restrain, to hold back, to check, to deconstruct«), simply translated, means calming. The aim is to quiet one's thinking and experiencing and the structures of thought and experience, and to enable the transition to a new phase of the process in order to thereby interrupt their influence. In India an irrigation dam is a classic example of the controlled release of water, so that it moves in the intended direction and reaches the fields.

The vṛttis (Sanskrit *vṛt*, »to rotate, roll, happen, occur«), are states/patterns of activity and behaviour, which take place hurriedly, turn around in circles, and simply take their course. The different forms/patterns in which vṛtti can present/manifest itself (e.g. memories/remembrance, lack of knowledge/ignorance/unawareness) are elucidated at a later stage. Citta (Sanskrit *citta*⁷, »that which is thought, experienced«), is a perfect participle. This making of a distinction between attentive thought, perception and intention which is past – and has hence grown into a pattern – and attentive thought right now, in the present moment, is what forms the core of the definition of relaxation in yoga. It thus concerns the regulation and control of disturbing factors on both a conceptual and practical level, of

⁷ From the verbal root *cit*, »to perceive, to focus one's attention on, pay attention to, to align one's attention, concentrate, be attentive, observe, intend, wake up, understand«.

»cleansing«; it is about bringing freedom (*mukti*⁸/*vimokṣa*, »free«) into the story of one's life to date.

That means that when mindsets and states of feeling originating from the basis of citta no longer pose an obstacle, the result is freedom, openness and attentiveness for the present. The objective is the appropriate, correct cultivation (of oneself) which gradually eliminates what is not intended, and develops what is intended. A classic comparison can be made to the purification of gold. What then emerges is the »power of attention« (Sanskrit *citśakti*, »the force, impact, capability«, von *cit*, »be alert«). A purposeful process, that becomes possible by using an internal »reserve force«. Another classic comparison is a mirror-calm lake without waves. The vṛttis can be likened to the movements of the waves, which have a rolling component, and which symbolise agitation, are calmed / held in check. Śavāsana is considered to be a particularly difficult āsana to master, since its aim is to put a stop to this turning around in circles. A simple observation in yoga is that it is not easy to relax permanently tensed muscles, even by lying down. For this reason the standing, sitting and supine āsanās as well as the further programme (Fig. 1, a ten to twenty year programme) are used for the reduction of muscular, visceral, sensory and mental/emotional imbalances.

Shoulder balance is learned after that (*sarvāṅgāsana*, »all element āsana«, »arms-trunk-legs āsana«) until 10-20 minutes are possible. Afterwards headstand (*śirṣāsana*, »head and neck«). These two help further stabilisations of inner mental-emotional-bodily processes.

⁸ »To free, relax, let go« (*vimukti*) is put explicitly in saṅkhya: just as the cow's milk is nourishment to the calf, prakṛti sets one free. Prakṛti's function is also to free oneself (Saṅkhya-Karika 56, 57, 58).

The most difficult āsanas are backwards elongations (stretchings), side-stretchings and so on, as well as ambitious lying āsanas like supta-virāsana. The chest is convex curved, the abdomen is flat, what allows free breathing. A number of muscles are relaxed, others are active and help to expand – a continuing process phase.

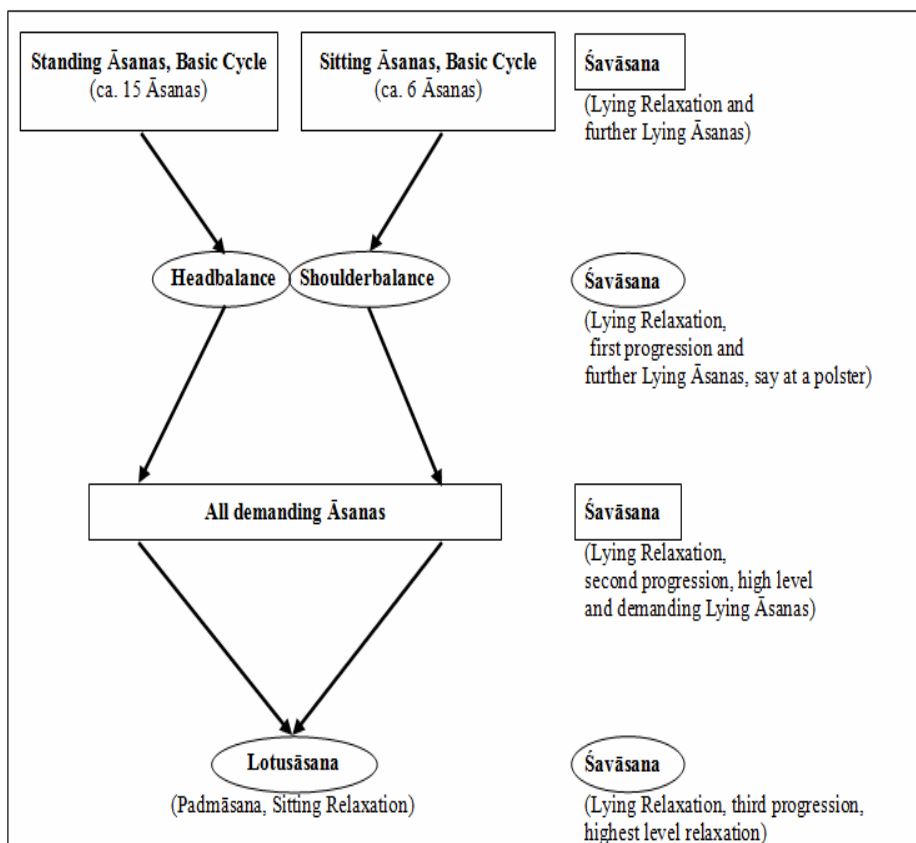


Figure 1 Systematic Overview of the Āsanas

Śavāsana (Fig. 2) stands at the end of this process, which, as described in a medieval text, takes away the tiredness which arises through the other āsanas, and brings calm to one's thoughts.⁹

Different levels of relaxation exist depending on the processes which where possible before. A successful śavāsana is half the action (relaxation, *dhyāna*) which is possible in padmāsana.

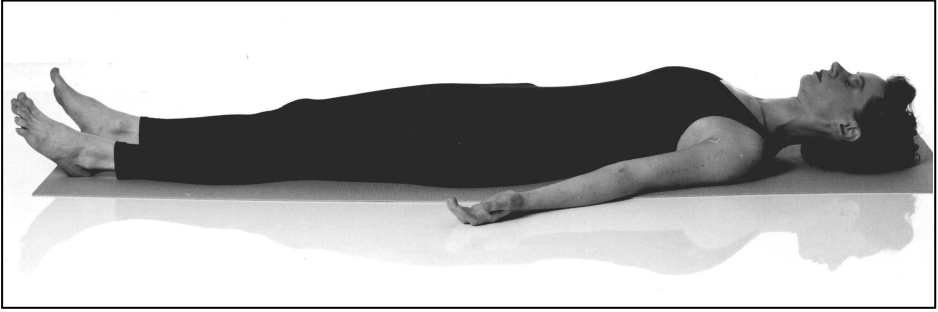


Figure 2 Śavāsana

⁹ In the words of the Hathapradipikā (II. 19), a text from the Middle Ages, “*atha śavāsanaṃ – uttānaṃ śavavad bhumau śayanaṃ tu śavāsanaṃ / śavāsanaṃ śrāntiharam citta-viśrānti kārakam*,” “This is Śavāsana: stretched out like a corpse (with strength, with the strength of *prakṛti*) on the floor (on an even surface and allowing oneself to rest)”. Śavāsana leads the process phase through taking away, chasing away, destroying tiredness, that which is disturbing, a nuisance, boring, tiresome, withering (*śrānti*), and replacing by recovery, relaxation, calming, giving free reign to, interrupting and alternating (*viśrānti*) in citta. This process is not a completed occurrence; it is a process, which is currently taking place within the person, and both qualities of process referred to give information on the strength of the process. – It bears a slight similarity to a corpse floating on a lake. The median plane (mid-frontal/coronal plane) between anterior and posterior is the plane of relaxation, not the area of the body which is in contact with the floor.

The withered and the other States: the Ten Vṛttis

There are five different states – mindsets or patterns of awareness (*vṛttis*), the »withered« (Sanskrit *kliṣṭa*, »bothered, in need, stressed, withered, giving rise to suffering«), and the »non-withered« states (Sanskrit *akliṣṭa*, composed of the negative particle *a* + *kliṣṭa*, »withered«).¹⁰

Both the overestimation of pleasant occurrences and thoughts, egoism, and of unpleasant occurrences and thoughts, egoism and narrow-mindedness, up to and including the fear of death, are the others. Here the yogic approach to stress management and relaxation becomes clearly visible. It is essential that mental/emotional behaviour patterns be recognised and considered to be alterable. Yoga is a means of calming states of inner agitation which results from the overestimation of preferences and dislikes, which from an unclear picture of one's own self, and from narrow-minded ways of thinking. The five »non-withered« states are beneficial, even if these are not the ultimate goal.

The five »non-withered« are: 1. *pramāṇa* (from the Sanskrit verbal root $\sqrt{mā}$, »measure«), the means by which one obtains accurate and valid knowledge about the world (from the verbal root $\sqrt{mā}$, »measure, means of knowledge, valid source of knowledge«), 2. *viparyaya* (from *vi* + *pari* + the verbal root of \sqrt{I} , »to go, surrounding knowledge, context; knowledge which is close to the goal«), 3. *vikalpa* (from *vi* + the verbal root of $\sqrt{kḷp}$, »fantasy, alternatives, possibilities, assuming«), 4. *nidrā* (from »ni« + the verbal root of $\sqrt{drā}$, »sleep, fall asleep, be asleep«), 5. *smṛti* (from the verbal root $\sqrt{smṛ}$, »remembering, memory«).

The five withered *vṛttis* are: 1. *avidyā* (from the negative particle *a* + the verbal root of \sqrt{vid} , »knowledge«; »the state of not knowing, ignorance«), 2. *asmitā* (»I-am-ness, overestimation of the I«), 3. *rāga* (»overestimation of the pleasant«), 4. *dveṣa* (»overestimation of the unpleasant«), 5. *abhiniveśa* (from *abhi* + *ni* + the verbal root of $\sqrt{viś}$,

¹⁰ YS I. 5, 6; II 3,ff

»to, enter, step into«; »restricted thinking, being blinkered, narrow-mindedly clinging, especially to life«). With regard to the withered states, the lack of basic yogic and practical knowledge *avidyā* is the generic term.

Here the yogic approach to stress management and relaxation becomes clearly visible. It is a question of recognising mental-emotional patterns, and to see them as being alterable. Yoga is a means of calming inward agitation, which comes from the overestimation of preferences and dislikes, from an unclear picture of one's own self, and from narrow-minded thinking. The five non-withered states are useful, even if these are not the ultimate goal.

Sleep is a relaxation state of the highest quality. If one succeeds in consciously tapping the resources of a relaxing and regenerating deep sleep, the »relaxation-āsana« will be particularly effective.

All ten states can lead to a person turning around in circles, caught up in symbolic trains of thought which are detrimental to the quality of their present state. The woman who could not stand on one leg is a typical case example of turning around in circles: A woman of around 35 years was unable to stand on one leg despite practicing for a long time. This is unusual, since it can normally be expected that the ability to stand on one leg will be improved after months of training (Stork 1990). In the course of a one-week yoga seminar, the woman remembered during the night that as a child she had broken her leg and that the other children had carried her home. From this point onwards the woman was able to stand normally on one leg. As she had previously undergone psychotherapy (with depth psychology orientation), it was also straightforward for her to come to terms with this.

The two Procedures of Yoga for Relaxation

According to the Yoga-Sūtras, all of the ten states (the ten *vṛttis*) can be calmed through two procedures. Through *abhyāsa*, »to align one's

attention« (from Sanskrit *abhi*, »a movement goes in the direction of, hither, the act of adding anything, be at the object of attention, to align with and stabilize a yogic pattern« + *as*, »to sit, to be in«) and *vairāgya*, »not to work oneself up, identify with, allow oneself to be overwhelmed by things; not to identify oneself with things; a non-vehement, non hot-tempered, non-violent and non-disordered state« (from Sanskrit *vai*, »free of, without« + *raga*, »to colour« + *-ya*, »to be, i.e. to be non-coloured«).

To align one's attention (*abhyāsa*), to make oneself one's object of attention; this approach means having knowledge from the yoga tradition with regard to the object, and to make the effective effort which stems from practice in order to master the yoga exercises. These consist in the intended activity and relaxation states. This act of alignment takes place initially on a mental/emotional level, and requires the necessary inner attitudes for the attainment of the yoga objectives. It is a matter of building the foundation for yoga which shows the corresponding quality criteria. One such criterion is an attitude of welcome (*satkāra* from *sat*, »to welcome, to be friendless« from *sat*, »being existing, to happen« and *kāra*, »maker«) which is characterised by a welcoming attitude shown in friendly service and hospitality towards the guest.

The second approach is to achieve the state of »uncolouredness« (*vairāgya*). »Colouring« is likened to the act of dyeing or colouring a physical object; it is a matter of being affected by psychosocial influences, being attracted by, caught up by, a state of being flustered; an irritated, agitated mood. To be »coloured« is, to the Indian way of thinking, to be influenced by strong emotions and impressions, or perhaps by stress, by unreflected, unresolved and unconstructive patterns of thought and behaviour. Strong feelings may »colour« in this way, but must not necessarily do so. The goal, therefore, is not to work oneself up about things or topics, but to look them, as it were, calmly in the eye. It is the search for independence, which can be compared to a small child who is strongly attached to its mother, and who can become independent through finding (that which corresponds to) its own self-consciousness / self-assurance / self-confidence – which

is uncoloured – and isolating itself in a positive sense (a sense of autonomy and self-love resulting from the awareness of individuality), of being a separate entity. The search for independence is described here deliberately in negative terms, since the Yoga-Sūtras wish to avoid describing to a person from the outside what freedom is. Classical examples of learning this freedom, which comes from within are the »calls of nature« described in āyurveda, such as hunger, thirst and the need to empty one's bladder and bowels. To perceive, accommodate and rhythmicise these »calls« is conducive to relaxation.

Both of these approaches thus serve to build a foundation of yogic experience. Both make the deceleration, containment (*nirodha*) of experience and thought – and hence relaxation – possible. Expressing this in the simplified terms like »practicing and letting go«, or »getting on well, succeeding« does not do adequate justice to the Yoga-Sūtras.

The Beginning of the Western Understanding and the Basis in Sāṅkhya

The precision of the yogic states of experience led to comparisons in depth psychology/psychoanalysis by the beginning of the last century (e.g. Costler 1934, also Schultz 1932). Self-hypnosis adopted certain basic elements of yoga and parallels can be seen between the two. An important insight from yoga is the understanding that the focussing of attention, and intention, can influence physiological states. Yoga is based on the sāṅkhyaphilosophy (»looking at the fundamental aspects (taken) together as a whole«, from Sanskrit *sam*, »whole, together« + *khyā*, »catch sight of, behold, count«)¹¹. Yoga and its partner

¹¹ This was already described by Schultz (1932). He rightly expresses the hope of mastering the »actual content of yoga« – and criticises the European religious attitudes towards yoga, which omit / neglect the body. Comparable Indian schools of thought are criticised, for instance, by the Indologist Zimmer (1976), who demonstrates how Yoga is interpreted in the sense of popular Brahmanism. This lack of conceptual clarity in the Western understanding is not seldom found with regard to

philosophy, the classical sāṅkhyaphilosophy (based on the text of the *Sāṅkhyakārikā*), mark the beginning of the technical philosophical tradition. Sāṅkhya has strongly influenced the sciences in India, and defines the important basic concepts of the understanding of the psyche and the capacity for insight, perception and action which goes far beyond sāṅkhya.

The »inner instrument« *antarakaraṇa* (Sanskrit *antara*, »inside« + *karaṇa*, »instrument, to cause an effect«), which serves distinct functions, is described as threefold: as *manas*, *ahaṅkāra* and *buddhi*, i.e. as mental/intellectual consciousness, I-consciousness and sense of knowledge and decision.

Manas (Sanskrit *man*, »mean, think, consider«) is considered to be the watchman at the entrance gates for sensory perception (in present-day terms thalamic gates in the context of the psychophysiology of selective attentiveness; cf. Birbaumer) and the exit gates for action, and conceptualises both sensory perception and action¹².

Ahaṁkāra (»what makes the self the self«, from Sanskrit *aham*, »I/self« + *kāra*, »the one who does, carries out«) is defined as *abhimāna* (Sanskrit *abhi*, »towards something, face to face« + *man*, »to mean, be meant«) and means self-reference, the feeling that one is meant personally, both with regard to inner desires and imaginings and to the external world. It can be legitimate proud and can shift to arroganz, conceitness, trauma and following error in reasoning.

Buddhi (Sanskrit *budh*, »awaken, awake, pay attention to/honour, have insight«) is defined by the ability to grasp things clearly, and a confident decision to act (*adhyavasāya*). The mental effort required in order to clearly identify that »this is a pot«, happens in *buddhi*, just like

Yoga / Meditation, such as in the Brochure no. 11 of the group of psychological specialists entitled, »Yoga is not a religion« (Mitzinger, 2010).

¹² The German word »to note, take note of, remember«, comes close to the meaning of *manas*. This originally meant: to make recognisable and to notice that which has been made recognisable; in the area of perception it means to notice something, and in the area of action to mark, make clear, recognisable.

the action which places value on something which is clearly understood, and which reaches a conclusion. Both of these are paths to peace and forgiveness. The most important predisposition of buddhi is the opposite of being ignorant. The most important predisposition of buddhi is to gain knowledge (*jnāna*). The most hindering predisposition is the opposite, to have no or wrong knowledge (*ajnāna*). De-colouring and its opposite, the possibility of colouring, is likewise one of the predispositions of buddhi (Sāṅkhya-Kārikā 23-28). Buddhi is, therefore, from the sāṅkhya perspective, that part of the inner instrument which enables both of these yogic procedures to take place. Like the Sāṅkhya philosophy, yoga too has the goal of understanding this inner instrument in its way of working and its states, and to utilise these accordingly. Sāṅkhya places emphasis on a method which leads to insight. Sāṅkhya names these procedures likewise abhyāsa and speaks of tattva-abhyāsa (*tattva*, »thatness«), the alignment of attentiveness to the twenty-five basic principles of human understanding. Here, as in »not working oneself up« (*vairāgya*). This is the connection to salutogenic learning processes within the context of one's own psyche and psychotherapy. The named basic concepts indicate the areas of learning: to recognise how one is acting, and to initiate, on one's own initiative, withering or non-withering processes. Meant are the learning to make I-statements / I-messages and self-referential statements (self-actualisation), the increase in knowledge and learning how to grasp things clearly and make a conscious decision to act. It is the ability of »not getting worked up« about experiences, thoughts on the analysis of causes and seeking new ways of dealing with things, etc. One thing, however, is clear: Yoga cannot replace an in-depth psychotherapy, but what it can do is to reveal problems and supplement this process, or in less severe cases, contribute to their solution (Strauß 1991).

Besides the three aspects of the "inner instrument", there are further basic principles (*tattvas*); these are: one's own inner nature prakṛti (Sanskrit *pra*, »out of, forwards« + *kṛti*, »made«), and content-free consciousness puruṣa (person, main characteristic is conscious), from a modern viewpoint probably the CNS »master system« of the general

state of consciousness (Mitzdorf 1994). Āyurveda describes in detail the inner nature (*prakṛti*). The aim is to stabilise its ways of working and functioning. The most important and easily excitable regulating factor which controls all movements is the vata. This common controlling factor regulates the different aspects of the inner instrument (Sāṅkhya-Kārikā 29) and the entire psyche/body context in the yoga exercises according to the classical understanding according to what is »appropriate«, i.e. not too much or too little, neither wrong; the aim is to move from an inappropriate to a »freed« state.

The understanding thus described of the way of working of one's own basic principles which build the internal world and the frame of reference to the external world, including the recognition of content-free consciousness, is yogic relaxation, is yoga, yogic »meditation« (Latin *meditation* »behold and dwell in/upon«). The specialised term for this is samādhi (Sanskrit *sam*, »matched, harmonious« + *ā*, »from and on all sides« + *dhi*, »thinking, perspicacity«). Samādhi is the yogic concept of relaxation as the summarizing and comprehensive recognition of one's own natural states and the content-free and therefore relaxed consciousness. In a nutshell – as it is said in yoga – a successful śavāsana is already halfway to samādhi. The lotus āsana that is required for samādhi is prepared along with the other āsanās over many years. There are two types of samādhi. For the first, the following four steps are required: 1. the clear and logical formulation of tasks to be accomplished (*vitarka*), 2. the effort and dedication required for solving the task (*vicāra*), 3. the brightening of one's mood and the peace of mind which come with the solving of the task (*ānanda*), 4. the resultant inner state of being (*asmitā*). The echo of this is the other state of samādhi (Yoga Sūtrani I.17ff.)

Yoga – a Draft for the psychological-physically caused View from Within

What exactly takes place on the sensory and motor level with regard to intention and attention/attentiveness, when yoga is practiced? Above

all, it is important to understand that yoga āsanas are the beginning and not the end. Yoga-postures enable something to be done which is outside of normal everyday experience. The action of the nervous system, such as reflex actions, plays a part in this. Through repeated stimulation (facilitation), these reinforce the postsynaptic response.

The unique aspect of the āsanas is that one deliberately keeps the mainly peripheral directed motility completely still, while stimulating the postural motor system to work. The feet and hands, legs and arms are – for example in the half dog pose – expanded to their maximum length (stretched), held still and stabilised, while one at the same time and in the same space stimulates and stretches the right side of the rump and the left side of the rump simultaneously.

After a short, initial isotonic phase of moving into the yoga pose follows a long phase (often lasting up to two minutes) of permanent isometric contraction of the muscles with few interruptions, which is then followed again by a short isotonic phase of moving out of the yoga pose. Mainly the extensor muscles, i.e. the leg and arm extensor muscles and the postural trunk muscles are used here. All joints are held stably and fixed in their joint positions with little effort simultaneously in a common space.

The load on the individual muscles and tendons varies from one yoga āsana to another. This results in a widely varied activation of the individual muscle groups.

The isometric contraction of a muscle group takes place parallel to the initially passive, later active, stretching (this was adopted from stretching exercises into the field of sports), and/or the relaxation of a different muscle group. The »active« relaxation of muscle groups which are normally frequently active, such as the hand flexor muscles, the biceps and the flexor musculature of the back of the thigh, is intended and also preferred.

The planned and intended calm, the long holding of the posture, often over a period of one to two minutes – in some positions from two to

five minutes and longer – with the stimulations which are becoming stable, and which have a stabilising effect, is one of the essential attributes of the yoga āsanas.

The conclusion from the above is that a yoga āsana, as a full body exercise, is a complex »motoric orchestra«. Not only the poses themselves, with their calm duration, and the posture which is not normally taken up by a human in an everyday setting, are unusual. Almost every rule of the normal use of the muscles is »reversed«, i.e. reconstructed on the basis of its key structure.

From the perspective of Indian medicine and yoga, the so-called marma points places of (potentially lethal risk) of ayurveda and yoga (Bögle 2007) play the decisive part (fig. 3). These are relatively autonomic modules of action; ten marma points are located in each of the three segments of the legs and arms. These locations defined by functional and structural models – such as joint centres, muscle centres and tendon centres – give the measure for the correct execution of the āsana. The controlling subject (person) takes up position in these inner locations in the āsana by »sitting calmly« (the same happens externally as he/she sits down on the chair). In doing so, he succeeds in stimulating his/her own sustaining processes and improving the functioning of the most important ayurvedic regulating factor, the vāta. Concentration and attention are directed towards these states and processes. Yoga devotes a large part of the attention to body awareness, bodily sensation (somatosensory system, differentiated proprioception), which is located in the muscles, joints, tendons, blood vessels, the outer layer of skin and the inner layers of skin (e.g. of the periosteum).

Mindful attention is also classically directed towards the body's internal organs (visceral sensitivity), and particularly to breathing. Attentive observation is directed in particular to yogic breathing without voluntary influence: breathing freely. This is considered to be the most important breathing »exercise« in yoga. In the clinical sector Leye (2007) has collected case studies which demonstrate improvements of the lung function through stimulation of the marma points.

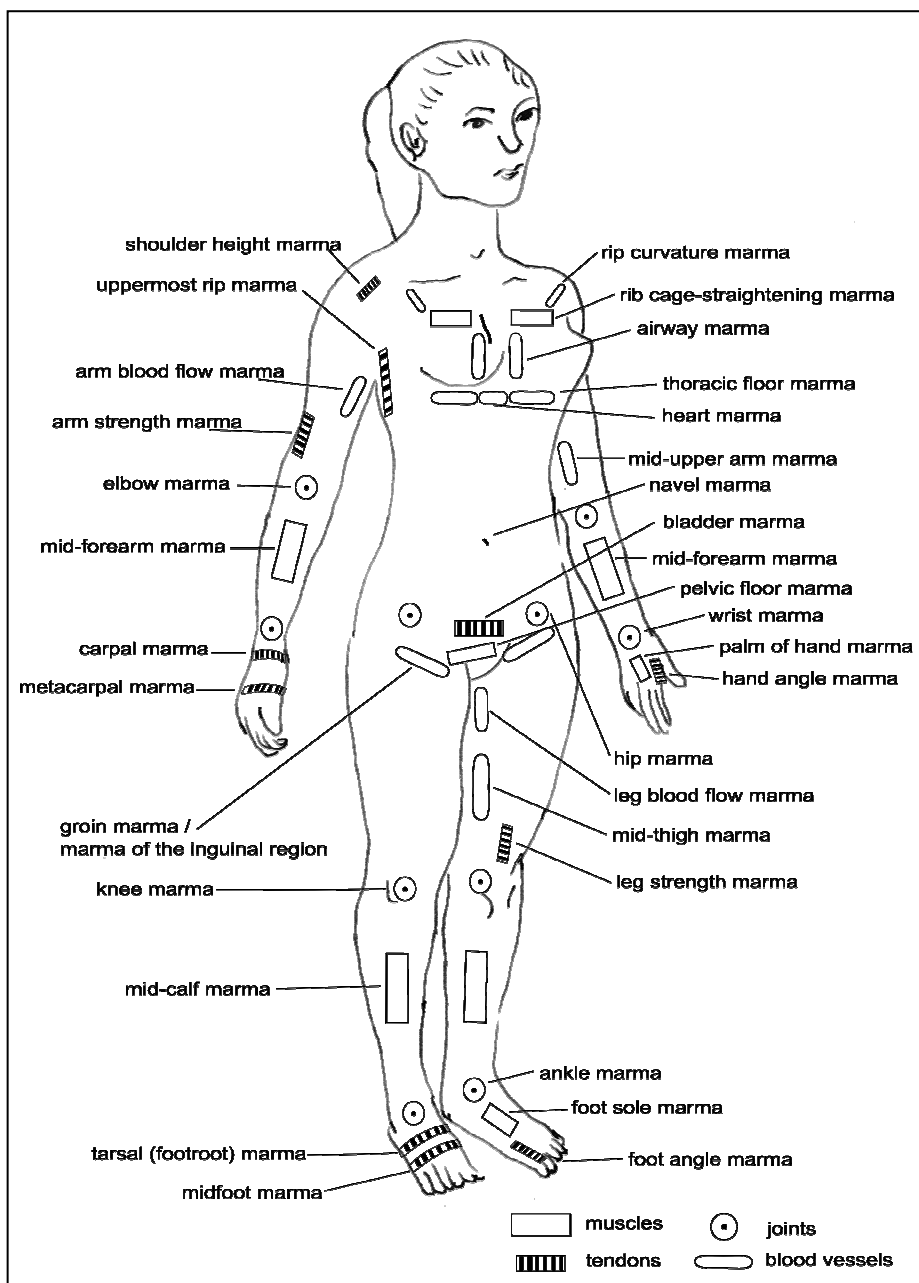


Figure 3 The Marma Points in Yoga

A further goal of learning is to modify attention in such a way that it can observe these states of process. Memories, ideas, annoyance, mourning and other things are often to be understood in connection with past experiences/events of one's life, or should be integrated communicatively into current life situations and dealt with. Pleasant, relaxed states of mood and feeling are often accompanied by relaxed attentiveness. The modification of attention itself, and the effects which arise in the attention and in breathing through concentration on one's own breathing, are a further specific attribute of yoga, and competence – like a self-sharpening tool – for creating desired states of attentiveness. This attentiveness is seen as so important that it can be said: **without attention there is no yoga = yoga only with attentiveness.**

Intention, attention, regulation, reversal and feedback are, in our opinion, important concepts from the neurosciences in order to understand yoga.

The following actions and modules of the central nervous system are involved in yoga. The top-down mode of functioning of selective attention is controlled in the āsanās by the dorsolateral prefrontal cortex. More recent studies have shown that a centre in the right prefrontal cortex is responsible for the interruption of habitual reactions. Yoga is concerned with the interruption of learned posture patterns in favour of theory-driven strategies for improvement.

Emotional involvement self-referential attention was confirmed by a functional MRI study (Davidson 2003). Also a 27% increase of the relaxation-inducing and mood-enhancing neurotransmitter GABA was measured, while in the control group, which instead spent the time reading, no changes were observed (Streeter 2007). Exactly how the reduction of anxiety through muscle relaxation works is not yet clarified. Alterations in the autonomic nervous system are not the cause (Conrad, Roth 2006). Our guess is that this is the state of »wakeful calm« which we described.

Both types of movements known by the neurosciences play a part here: projectional action, i.e. action which is not guided by sensory perception, and piloting action, i.e. action in which guidance by sensory perception and the corresponding feedback plays a part. This means the involvement of the medial and lateral cortex.

The guidance is brought about by localised tactile perception and proprioceptors (»cortical sense«) and the stabilising signal streams of the so-called long loop (bottom-up processes) – and not through visual or auditory perception as is the case with most routinised tasks occurring automatically.

Yoga tries to consciously influence the sub-conscious postural movements – the »cortical movements«. The alpha-gamma coactivation for the postural motor system becomes important here (cf. Birbaumer 2003). The cortical representation in the primary sensory and motor cortex is in all probability updated and improved, as is known in the case of violinists, or from experiments on animals (cf. Spitzer 2002). Spitzer emphasises the significance of the directional focus of attention in learning for the experience-dependent alteration of cortical representation and for emotional involvement during learning.

The general level of activation is controlled by the variations in CO₂ saturation – as a consequence of the regulation of breathing resulting from the yoga āsanās. Some of my own preliminary studies (Phadke 2005) on how yoga influences the autonomic nervous system show that the level of general activation of the sympathetic nervous system varies greatly in the different āsanās, and is several times higher in some āsanās. In śavāsana and afterwards, this contributes to the development and stabilising of the parasympathetic tonus.

Relaxation as a Benefit of these Actions and Reverse Processes

The evolutionary development of action in the periphery, for example ambidextrousness, with increased freedom of scope for the use of the hands, becomes relaxation as a reverse process in yoga. This enables a »vacation« from everyday activity – a sort of »wakeful calm« (no longer turning around in circles – *citta vṛtti nirodha*). By utilising the neuroplasticity of the brain, opportunities for new learning and growth arise. Opportunities for autoregulation are created. Balancing actions occur. One of the reversals is from stress to relaxation, another from flexing to stretching.

From the outside world, which normally demands continuous alterations in concentration, perception and action, the calm aspects are used – the firm ground, the constant, warm room temperature, the calm air, the quiet and optically neutral surroundings. In a calm standing, sitting or lying posture in the āsanās, the internal world occupies itself with its own basic structural components (muscular activity, bone support, expansion of the inner space, marma points, concentration, the calm flowing of vāta and breathing), whereby yoga provides structural and functional models instead of impulses from the outside world. The gateways to the senses can allow one's own bodily perception to come through (*manas*), self-reference becomes possible (*ahañkāra*), and the attention can be occupied by present experience instead of that which is past, and foreign to its own nature. From the yoga perspective, this leads to inner calm, relaxation and forgiveness (in *buddhi*), and develops an understanding which arises from one's own understanding and experience, as it were, one's own inner portrait.

This inner-outer relation, which is more strongly influenced by inner factors, at first, requires sufficient concentration in the āsanās in order to facilitate »switching over and switching off«. Later one learns to reduce the effort while keeping the attention focussed. Here energy is invested in itself, and this leads to the relaxing and refreshing effect often observed after yoga (»a non-withered« *akliṣṭa*-state).

One learns in yoga to measure the activities according to one's own body weight and not to collapse under gravity, but to develop inner elasticity and posture. The favourable attitude/posture (*vairāgya, satkāra*) during observation of one's body and breathing, that is »the agreement/correspondence of intention and long loop, for instance during the observation of leg and arm stretching«, and »breathing freely in one's own rhythm of one's own breathing«, gives a measure for calm and relaxation.

From the yoga viewpoint, attention is measured in portions (*kṣaṇa* »around 3 seconds, a moment, a short while, a phase«). According to studies in the three-second rhythm of attention, the brain generates the »now« of the present (Pöppel 2000). One breath lasts approximately three seconds. This »now« is also made the object of attention in yoga. Since every observed breath can be experienced as new and different, non-automised attention (*citta-vṛtti-nirodha*) can be learned and experienced, and this is considered to be a turning point for the yogic learning experience.

Perspectives

From the author's viewpoint, a good way to operationalise the processes is the next step. This requires clear, specified intentions to act, and expectations for the result of action, so that the success of action can be measured against corresponding criteria. To this purpose the authors (2007) have developed the »Starnberg muscle tone scale« in order to be able to measure the desired degree of sensory muscular tension in the stretching and flexing loops in oneself or another person. The validation of this instrument would be desirable as one of the next steps.

By means of precise instructions, which permit specific intentions, and which are connected with clear, and particularly functional models (according to the marma philosophy), yoga practitioners are in a position to recognise discrepancies. With the aid of central processing stages, they can make a consciously modulated choice – with regard to

alterations of information uptake (e.g. the direction of one's attention) and/or ways of acting (e.g. increased or decreased dosing of strength, other variations of performing motor activity).

These relatively autonomic modules of the segments and marmas with their special characteristics could enhance one's own contribution and the collaboration for posture. The sometimes laborious expansion of the treasury of stored postures can reduce mistakes and redundancy of effort with regard to movement (cf. Rosenbaum 1994). This can be achieved through the corresponding regulation of the degree of wakefulness and the intention. In this way, yoga practitioners can find out through perception markers that the unconscious feedback loops, and those which are not capable of consciousness (interoceptive and exteroceptive) can give rise to the desired tonic activities.

The instructions on śavāsana quoted by Schulz (1932) already contain such information on the learning process: Lying on one's back fully relaxes a person's muscles. Residual muscular tension can be observed, a small amount of concentration effort is required in order to reach complete relaxation. This is performed from the ribcage to the stomach, legs and arms, and finally towards the brain. Free, rhythmic breathing should be developed very carefully, and must under no circumstances be associated with effort.

The teacher/learner dialogue classically plays an important part in yoga, in which the learner discusses his/her personal learning goals, procedures, solutions and experience with the teacher, in order to create an adequate context of meaning.

Further simple scales of this nature would be helpful in order to carefully control learning processes in the case of learners both healthy and ill. In the case of healthy people, however particularly in the case of the ill, the situation and position at the outset, and the lack of (cortically) stored positions is important in taking into account the learning goal. In clinical case studies it becomes evident that the interventions selected as examples have an influence.

Yoga āsanās enable »reversing«, marma-related access routes in the treatment of psychosomatic illnesses (Bhavsar 2001). Above all, it tries to activate and reactivate healthy components (resources). In this way, there is much hope that especially in the case of somatisation disturbances (»misdirection«), »interruptions« (with interwoven emotional factors), can be corrected. For healthy people the goal is to activate the possibilities of vāta which can be utilized for self-regulation, and to align these to one's own presence in (the dimensions of) space, time and motion (direction).

The Relaxation Process in the Perspective of Yoga

Key words

Yoga, relaxation, neurophysiology, psychosomatic intervention, regulation of learning processes

Summary

Relaxation in the perspective of yoga is shown from the basic conceptualisation of yogic experience. An overview of the research shows the various results and the actual situation with regard to relaxation through yoga. The neurological and psychological effects of relaxation through yoga are described. The way to come to relaxation is understood by the authors as »reverse processes« in the direction of their roots, as opposed to day to day processes and habits. A perspective for the further conceptual development of practice and research of yogic relaxation for healthy and psychosomatically ill people is given.

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Yoga is beginning to be rediscovered – not as an Indian idiosyncrasy, but as a philosophically, psychologically and biologically founded practical procedure in its own right. The Yogasutras are possibly the most important Indian text, and unique worldwide as a theoretical basis in conjunction with the practice of yoga. In an article on the current occasion of the 20th anniversary of the Yoga Forum München e.V. which – in the manner of a lexicon – provides a systematic overview and takes into account the discoveries made in the domain of neuroscience, the authors show what is understood by relaxation in yoga, and what this can achieve. A discovery of extraordinary importance is utilizing the possibility of focusing one's attention in order to achieve certain effects.

The intentions / objectives of learning yoga result through knowledge of the treasury of yogic knowledge, from which the issues and goals recognised as being of personal significance can be deduced. Of key importance is the transition in stages from stress / suffering / unknowingness, and tension / imbalance towards relaxation and the stabilising of bodily, psychic and social processes. These phase transitions can be achieved through reverse processes to the roots: towards the roots and away from the roots again.