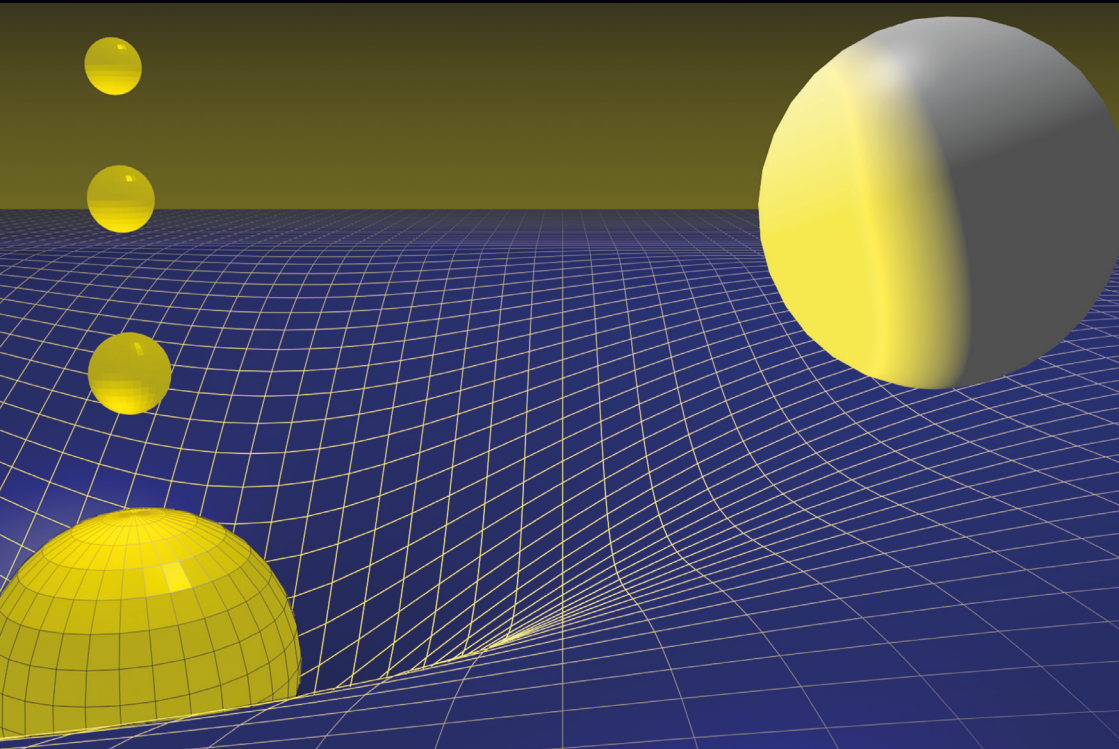


The World Model of the Historical Buddha

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Abstract

This work presents the world model of the historical Buddha that represents the five aggregates of grasping, which form the core of the First Noble Truth in Buddhism. The model operates based on a *dukkha* potential field, with pairs of internal and external sense bases. The magnitudes of attractive and repulsive influences of pleasant and unpleasant sense objects, respectively, are defined by their *dukkha* potentials. Volition is derived from the model as the gradient of the *dukkha* potential providing the driving forces of attraction and repulsion. Inclinations and disinclinations in the *dukkha* potential field are a result of a programming process by repetitive thinking and pondering. Experiments with the model confirm its functionality. Internal and external sense bases merge in the *mettā* state of loving-kindness, and the transition into a meditative *jhāna* state puts the model elements out of service. This model is a novel translation from the *Pāli Canon* that provides scientific clarity of the *suttas* and addresses natural science-oriented readers.

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Introduction

In this work, I translate some basic teachings of the historical Buddha into a scientific model to provide a new perspective for Western thinking.

A model represents a system of interest, referred to as the target system. Being a deliberate simplification of its target system, a model idealizes and reduces complexity while presenting relevant similarities with the target system. Parts of an investigation can be carried out on the model, wherein it is used as a learning tool for obtaining knowledge that can be transferred to the target system.¹

In the presently described analogical model, the target system encompasses the five aggregates of grasping, which constitute the core of the First Noble Truth of the Buddha.² The Buddha himself uses analogical thinking in similes: the mind is like a pool of water³, faults are like crooked chariot wheels⁴, right effort is like tuning an instrument⁵, the 4th *jhāna* is like a person covered with white cloth⁶, the refuge in *Dhamma* is like an island⁷, the *Dhamma* is like a raft⁸, ignorance is like a row of blind men⁹, desire is like man and woman in love¹⁰, a wise person is like a pillar at a ford¹¹, and many others.

These similes have the same function as models. They lead from the known (model) to the unknown (target system).

¹ Frigg and Hartmann (2018); Giere (1999); Buckley and Boulter (2000); Godfrey Smith, P. (2009).

² SN 56.11; Bodhi (2000).

³ AN 4.104; Bodhi (2012).

⁴ AN 3.15.

⁵ AN 6.55.

⁶ MN 119; Nanamoli and Bodhi (1995).

⁷ DN 16; Walsch (1995).

⁸ MN 22.

⁹ MN 95.

¹⁰ MN101.

¹¹ Sn 1.12; Thanissaro (2016).

The historical Buddha lived 2500 years ago. Given that modern people seek explanations of the world against a scientific background, I developed a model of psychic and mental dynamics from the texts of the *suttas* in a manner that is compatible with Western thought. Herein, I avoid inventing building materials for the modeling process because it would involve creating something that was not previously there. In this sense, my model is a new translation rather than an invention. I searched to discover the material in the *Pāli Canon*, in context, from similes of the Buddha and apply etymology of *Pāli* terms. The present descriptions are suited for natural science-oriented readers who are accustomed to models rather than *suttas* and lists of terms with the intention of helping these readers to recognize scientific clarity in the *suttas*.

In text, processes are described word by word. The elements of a model and their interactions are present at the same time. Because texts can explain models, I take advantage of both: model and text.

However, all models should be used with caution, because cognition is a model building process by itself. The Buddha exemplifies this notion with the famous parable of the blind men and an elephant. Briefly, a group of blind men who have never seen an elephant before attempt to learn what an elephant is by touching it. Each man feels only one part of the elephant's body and then describes the elephant. Each of their descriptions is unique and only captures a part of the elephant:

the elephant's head is just like a jar, the elephant's ear is just like a winnowing basket, the elephant's tusk is just like a plowshare, the elephant's trunk is just like the pole of a plow, the elephant's body is just like a granary, the elephant's foot is just like a post, the elephant's hindquarters is just like a mortar, the elephant's tail is just like a pestle, the end of the elephant's tail is just like a broom.

The blind men argued insistently, ultimately striking one another with their fists. The Buddha comments:

*They quarrel and fight - people seeing one side.*¹²

This parable highlights an important limitation inherent in the nature of modeling. That is, each observer builds his or her model by experiencing only selected parts of the target system. As modern folk wisdom has it, a model should not be confused with its target system, such as eating the menu rather than the dinner or mistaking a map for the mapped territory.¹³ In short, it is important to remember that a model does not incorporate the truth. It only presents an analogy that may be helpful.

Model of Consciousness

The Six Sense Bases

A world model would be expected to include everything: the all. The Buddha explains in the *Saḷāyatana Saṃyutta* on the Six Sense Bases:

*And what, bhikkhus, is the all? The eye and forms, the ear and sounds, the nose and odours, the tongue and tastes, the body and tactile objects, the mind and mental phenomena. This is called the all.*¹⁴

Six internal sense bases are the sense faculties: eye, ear, nose, tongue, body, and mind. Six external sense bases are their respective objects: forms, sounds, odours, tastes, tactile objects, and mental phenomena. This constitution differs from Western culture which does not recognize the mind as the sixth sense. Even modern knowledge about distant galaxies originates from data extracted from scientific instruments that are processed by at least one of the five outer senses and the mind (sixth sense). The scientific instruments themselves and their outputs are external sense objects.

¹² Ud 6.4; Thanissaro (2012).

¹³ Merali (2000).

¹⁴ SN 35.23; Bodhi (2000).

I have taken the aforementioned six internal and external sense bases as the starting point for the process of model building to be applied to explanations of consciousness, feeling, perception, and volition. In Figure 1a, the external and internal sense bases are presented as poles in a bipolar constellation. I chose to represent the poles as simple spheres.

Consciousness

The *Madhupindika Sutta* explains the interdependence of sense bases and consciousness as follows:

Dependent on the eye and forms, eye-consciousness arises... Dependent on the ear and sounds, ear-consciousness arises... Dependent on the nose and odours, nose-consciousness arises... Dependent on the tongue and flavours, tongue-consciousness arises... Dependent on the body and tangibles, body-consciousness arises... Dependent on the mind and mind-objects, mind-consciousness arises...¹⁵

The *Mahāvedalla Sutta* describes consciousness as follows:

It cognizes. What does it cognize? It cognizes: 'This is pleasant'; it cognizes: 'This is painful'; it cognizes: 'This is neither-painful-nor-pleasant.'¹⁶

The next step in building this model was to represent pleasant, painful, and neither-painful-nor-pleasant (neutral) objects. We first consider the case of a pleasant sense object. Note that the internal and the external sense bases are on the same level in Figure 1a, but are on different levels in Figure 1b. In Figure 1b, the pleasant sense object makes an *impression*, symbolic of the *inclination* toward the object.

The two situations represented in Figure 1 correspond to similes of the Buddha. In Figure 1b, a worldly sense object makes an impression on someone who is not trained in mindfulness.

¹⁵ MN 18; Nanamoli and Bodhi (1995).

¹⁶ MN 43; Nanamoli and Bodhi (1995).

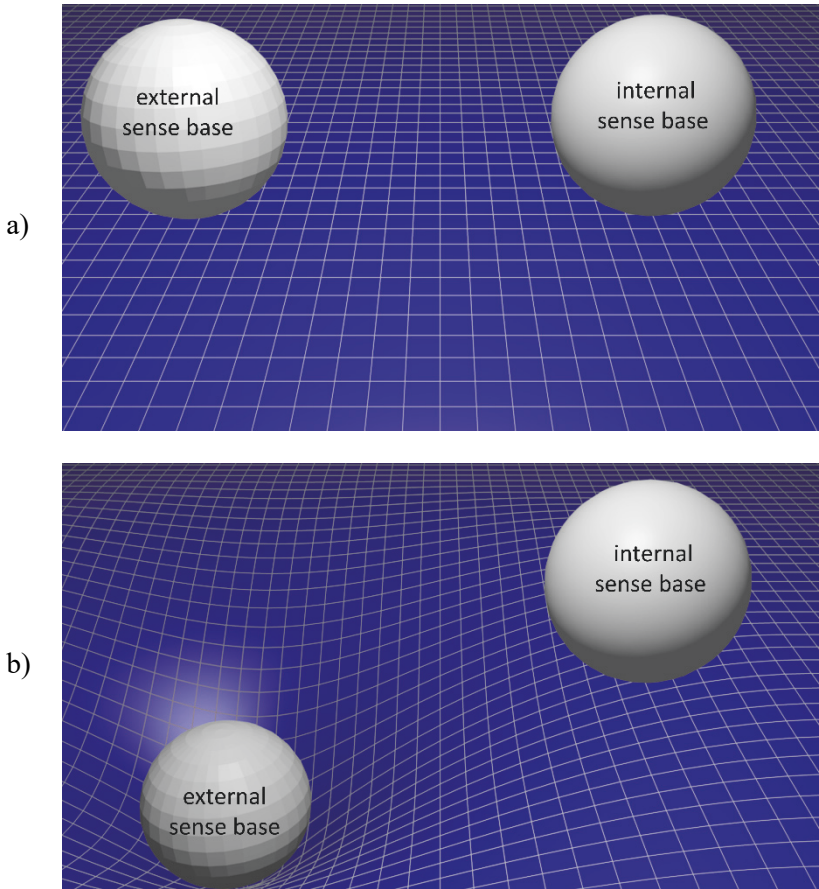


Figure 1.

External and internal sense bases represented as poles of a bipolar constellation.

a) A neutral sense object (external sense base).

b) A pleasant sense object (external sense base). The height difference reflects the difference of the dukkha potential.

“Suppose a man were to throw a heavy stone ball upon a mound of wet clay. What do you think, bhikkhus? Would that heavy ball find entry into that mound of wet clay?” – “Yes, venerable sir.”¹⁷

Differences in height within the model represent differences in *dukkha* potential. Although the term *dukkha* is often translated as suffering, I leave this term untranslated so that the reader may understand its original meaning with better clarity and appropriate nuance. The meaning of *dukkha* will be illustrated more clearly in the next steps of model building.

In the model, the existence of external and internal sense bases is a precondition for the appearance of a *dukkha* potential field. Though the Buddha did not use the terms potential or field to describe *dukkha*, both terms are incorporated into the model for explanatory purposes. At this point, it suffices to say that a pleasant sense object, which is an external sense base, is on a lower level of the *dukkha* potential field than the internal sense base (Fig. 1b), whereas a neutral sense object is on the same level as the internal sense base (Fig. 1a). Later, I will introduce unpleasant sense objects, which inhabit a higher level.

By contrast, in Figure 1a, the sense object does not make an impression on someone who is trained in mindfulness.

“Suppose a man were to throw a light ball of string at a door-panel made entirely of heartwood. What do you think, bhikkhus? Would that light ball of string find entry through that door-panel made entirely of heartwood?” – “No, venerable sir.”¹⁸

Thus, the internal sense base, external sense base, and consciousness are the first three elements of the model.

The meeting of the three is contact. With contact as condition there is feeling.¹⁹

¹⁷ MN 119; op. cit.

¹⁸ MN 119; Nanamoli and Bodhi (1995).

¹⁹ MN 18; op. cit.

Feeling

To integrate feeling into the model, I have incorporated the attractive quality associated with a pleasant sense object. Attraction corresponds with the *Pali* term *rāga*, which, literally, means color or hue, but is used in Buddhism to refer to desire and attraction to worldly objects.²⁰ Therefore, the pleasant feeling is represented in the model with the addition of color to the internal sense base (Fig. 2a). For a pleasant worldly feeling, I have selected the color red. The internal sense base is the pole where the sense faculty is located and thus where a feeling associated with a sensed object arises. Notice that the red color seems to radiate from the sense object (external sense base) toward the internal sense base. Here perception comes into play.

Perception

*What one feels, that one perceives.*²¹

Unlike the other core statements, a person-centered approach is needed to elucidate the Buddhist concept of perception. In the present model, the internal sense base can be seen as the place where the person seems to emerge.

*And what is the result of perceptions? I say that perceptions result in expression. In whatever way one perceives something, in just that way one expresses oneself, saying: I was percipient of such and such. This is called the result of perception.*²²

Perception operates *from* the position of the internal sense base. Thus, the same interaction shown from an external perspective in Figure 2a is shown from the first-person perspective in Figure 2b, wherein the object is seen together with the feeling associated with it (red).

²⁰ Rhys Davids and Stede, 1992.

²¹ MN 18; Nanamoli and Bodhi (1995).

²² A 6.63; Bodhi (2012).

*There are these six classes of perception: perception of forms, perception of sounds, perception of odours, perception of tastes, perception of tactile objects, perception of mental phenomena.*²³

Consciousness, feeling, and perception are inseparable:

*Feeling, perception, and consciousness, friend - these states are conjoined, not disjoined, and it is impossible to separate each of these states from the others in order to describe the difference between them. For what one feels, that one perceives; and what one perceives, that one cognizes. That is why these states are conjoined, not disjoined, and it is impossible to separate each of these states from the others in order to describe the difference between them.*²⁴

Volitional Formation

In the model depicted in Figure 2a, the internal sense base is positioned on an inclined potential field and underlies a force action: volition. Volition, or will, drives a course of action, such as approaching an object perceived as attractive. The mechanism of the model is analogous to how a ball behaves on an inclined plane. Volition is represented by the gradient of the *dukkha* potential, where gradient is the local rate of change of the *dukkha* potential with respect to displacement in the space of consciousness.

The Pali word *saṅkhāra* (volition) can be understood as “making together”.²⁵ Hence, volition brings the internal sense base towards the pleasant external sense object.

²³ SN 22.56; Bodhi (2000).

²⁴ MN 43; Nanamoli and Bodhi (1995).

²⁵ Nanamoli and Bodhi (1995), p. 55.

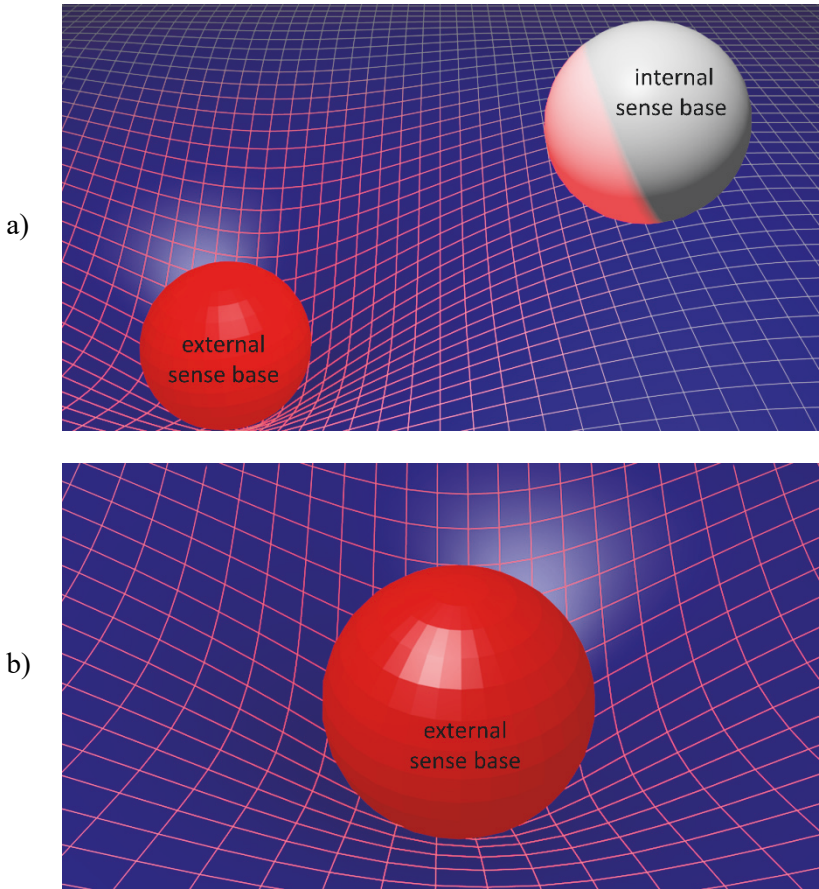


Figure 2.

A pleasant sense object.

- a) Explanatory perspective: the pleasant quality is felt (represented by redness) at the internal sense base. This quality seems to radiate from the sense object (external sense base).*
- b) First-person perspective: the pleasant sense object (external sense base) is perceived from the position of the internal sense base. The felt quality (redness) is attributed to the object.*

The Buddha asks:

*And what, bhikkhus, are volitional formations? There are these six classes of volition: volition regarding forms, volition regarding sounds, volition regarding odours, volition regarding tastes, volition regarding tactile objects, volition regarding mental phenomena. These are called volitional formations.*²⁶

Painful Feelings

Up to now, I have discussed only feeling and volition caused by pleasant sense objects. There are others.

*Bhikkhus, just as various winds blow in the sky: winds from the east, winds from the west, winds from the north, winds from the south, dusty winds and dustless winds, cold winds and hot winds, mild winds and strong winds; so too, various feeling arise in this body: pleasant feeling arises, painful feeling arises, neither-painful-nor-pleasant feeling arises.*²⁷

Contact with unpleasant sense objects can cause feelings of discomfort and pain. Whereas a pleasant sense object induces an inclination of the *dukkha* potential field toward it, an unpleasant sense object brings about a disinclination, as illustrated in Figure 3a.

The unpleasant sense object (external sense base) exists on an elevated *dukkha* potential level relative to the internal sense base. Thus, volition associated with this interaction corresponds to a repulsive force being exerted on the internal sense base.

²⁶ SN 22.56; Bodhi (2000).

²⁷ SN 36.12; op. cit.

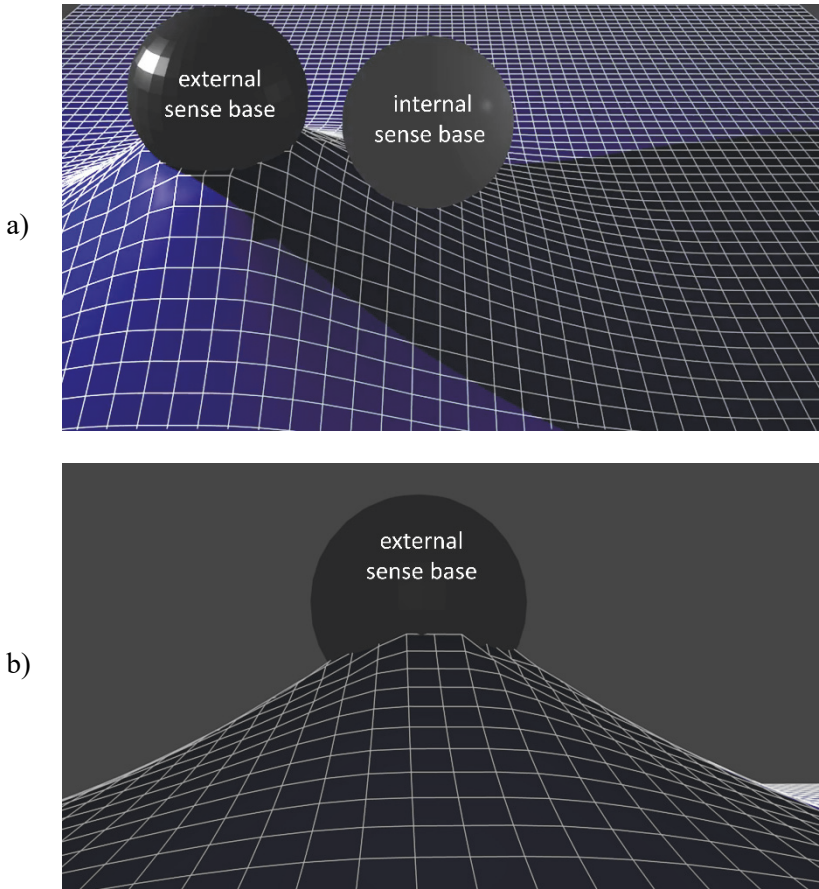


Figure 3.

An unpleasant sense object.

- a) *Explanatory perspective: the unpleasant quality is felt (shadow) at the internal sense base. The shadow seems to be cast from the sense object (external sense base).*
- b) *First-person perspective: the unpleasant sense object is perceived from the position of the internal sense base. The felt quality (shadow) is attributed to the sense object (darkness).*

In the case of an unpleasant sense object, the feeling incited is expressed by a shadow rather than a color because the color of an attractive sense object was deduced from the concept *rāga*, which means both color and desire. Conversely, I chose to employ a shadow to represent a feeling incited by an unpleasant sense object (Fig. 3a), inspired by a simile from the *Bālapaṇḍita Sutta*:

*“Just as the shadow of a great mountain peak in the evening covers, overspreads, and envelops the earth...”*²⁸

Perception results in a representation of the unpleasant sense object, which is dark from the painful feeling produced by a displeasing perception experience. Figure 3b presents the unpleasant sense object from the first-person perspective. Perception operates from the position of the internal sense base, which receives a painful (dark) feeling in response to the shadow of the unpleasant sense object.

The internal sense base is the locus of the sense faculty, where painful feelings arise and the impression of a person emerges. The internal sense base is repelled from the unpleasant sense object. Unlike a pleasant sense object, which attracts the internal sense base, here a repulsive force is at work.

The five aggregates of grasping

The model (Fig. 4) operates with five elements, which represent the five aggregates of grasping (*pañcupadanakkandha*): form (*rūpa*), feeling (*vedanā*), perception (*saññā*), volitional formations (*sankhāra*), and consciousness (*viññāna*).²⁹ These five aggregates are the content of the First Noble Truth:

And what, monks, is the Noble Truth of Suffering? Birth is suffering, ageing is suffering, death is suffering, sorrow, lamentation,

²⁸ MN 129; Nanamoli and Bodhi (1995).

²⁹ Bodhi, 2005, p.305.

*pain, sadness and distress are suffering. Being attached to the unloved is suffering, being separated from the loved is suffering, not getting what one wants is suffering. In short, the five aggregates of grasping are suffering.*³⁰

Hence, according to the Buddha, the impression of a person emerges with this set of five aggregates, as elaborated below:

1. **Suffering connected to form:** *birth is suffering, ageing is suffering, death is suffering.* Form is included in the sense base pairs of the model. Material form is comprised of the bodily organism with its sense faculties (internal sense bases) and the outer objects of cognition (external sense bases).
2. **Suffering connected to feeling:** *sorrow, lamentation, pain, sadness, and distress are suffering.* Feeling is represented in the model as colors and shadows at the internal sense base.
3. **Suffering connected to perception:** *being attached to the unloved is suffering, being separated from the loved is suffering.* In the model, perception is represented by the sense object, which is attached to or separated from the internal sense base in the space of consciousness.
4. **Suffering connected to volition:** *not getting what one wants is suffering.* Volition is represented by the gradient of the *dukkha* potential.
5. **Suffering connected to consciousness:** The model represents consciousness as sense-base pairs in the *dukkha* potential field. Pleasant and painful qualities are described by differences in *dukkha* potential. Consciousness cognizes:

*This is pleasant'; it cognizes: 'This is painful'; it cognizes: 'This is neither-painful-nor-pleasant.'*³¹

³⁰ DN 22; Walshe (1995).

³¹ MN 43; Nanamoli and Bodhi, 1995.

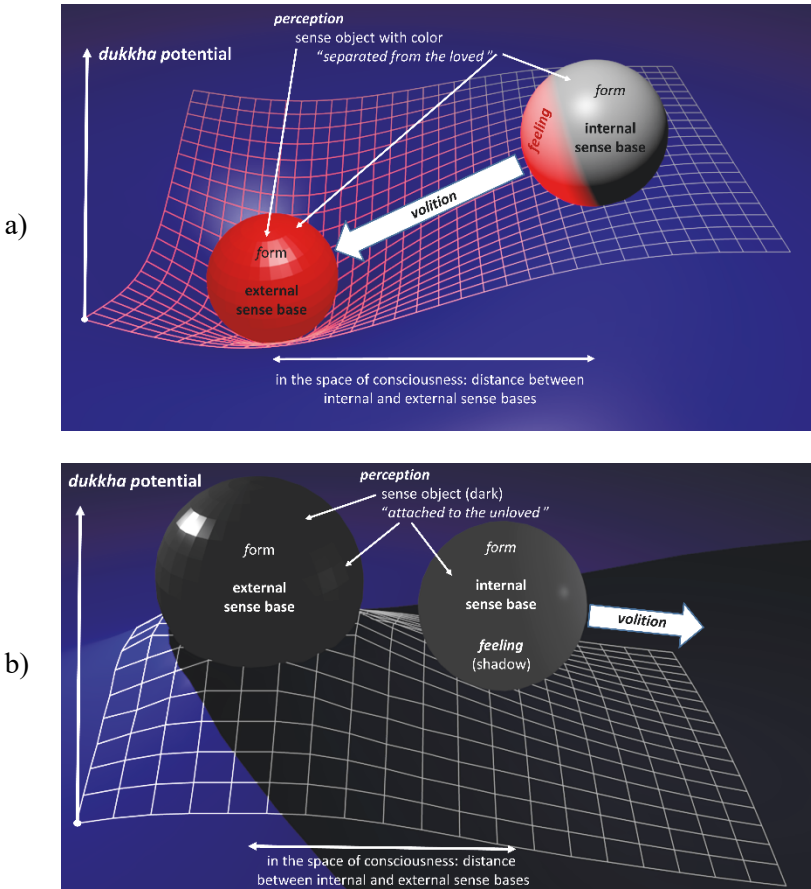


Figure 4.

Dukkha potential fields.

a) *The external sense base is a pleasant sense object.*

b) *The external sense base is an unpleasant sense object.*

Suffering and the dukkha potential field

The *Pali* term *dukkha* has a broad meaning that extends far beyond the meaning of suffering or dissatisfaction.³² Here, for modeling purposes, I have introduced the term *dukkha* potential as a quantity represented by a position on a scale (Fig. 4). When the space of consciousness is conceived of as constituting an x-y plane, *dukkha* potential describes a local displacement of the plane along the z axis perpendicular to a flat x-y plane. The magnitude of local ascent or descent on this scale is the *dukkha* potential. Because this scale has no upper or lower limit, experience leaves more to be desired endlessly due to the inherent tendency of the internal sense base to forever be drawn to a lower *dukkha* potential. That is, there is always a level beyond yet to be attained. This is the nature of *dukkha*. The level of the *dukkha* potential on which a sense object appears is the outcome of an earlier programming process as described later.

In the model, the *dukkha* potential unfolds in the space of consciousness, resulting in a *dukkha* potential field (Fig. 4). In this field, the *dukkha* potential has a value for each point in the space of consciousness.

To understand what is meant by the space of consciousness, we should consider the First Noble Truth, that is, *being separated from that which is loved*. The separation between the internal sense base and a pleasant external sense object can be in space, such as a desired chocolate in the kitchen. The separation can also be in time: vacation does not start until next week. There are other dimensions.

For example, a person may be far away from his ideal weight, social standing, or financial status. Conversely, people can remain emotionally close despite living on different continents. Therefore, separation is expressed in many ways, and the space of consciousness is that space occupied by such separations. It may encompass literal physical space, time, and many other dimensions.

³² op. cit., p.26.

In the model, the *dukkha* potential is analogous to gravitational or electric potential in the natural sciences.³³ The reference location, where the potential remains zero, may be infinitely far away. At any finite distance from a sense object, the *dukkha* potential will be greater than zero between the internal sense base and an unpleasant sense object (Fig. 4b) and will be less than zero between the internal sense base and a pleasant sense object (Fig. 4a).

The *dukkha* potential follows an inverse distance law, such that its slope becomes ever steeper as one approaches the sense object. This principle is confirmed by experiments with the model as described later.

Six senses

Thus far, the model has involved only one internal and one external sense base. However, there are six senses with agreeable and disagreeable sense objects:

*the eye pulls in the direction of agreeable forms and disagreeable forms are repulsive; the ear pulls in the direction of agreeable sounds and disagreeable sounds are repulsive; the nose pulls in the direction of agreeable odours and disagreeable odours are repulsive; the tongue pulls in the direction of agreeable tastes and disagreeable tastes are repulsive; the body pulls in the direction of agreeable tactile objects and disagreeable tactile objects are repulsive; the mind pulls in the direction of agreeable mental phenomena and disagreeable mental phenomena are repulsive.*³⁴

The Buddha gives a simile for this situation:

Suppose, bhikkhus, a man would catch six animals - with different domains and different feeding grounds - and tie them by a strong rope. He would catch a snake, a crocodile, a bird, a dog, a jackal, and a monkey, and tie each by a strong rope. Having done so, he would tie the ropes together with a knot in the middle and release them. Then

³³ Hamermesh and Landau, L. D. (2013).

³⁴ SN 35.247; Bodhi (2000).

*those six animals with different domains and different feeding grounds would each pull in the direction of its own feeding ground and domain [...] Now when these six animals become worn out and fatigued they would be dominated by the one among them that was strongest; they would submit to it and come under its control.*³⁵

Hence, the strongest impression dominates the others as illustrated in Figure 5 with six internal and six external sense bases.

It is important to note that all sense objects (external sense bases) and the emerging impression of a person (connected with the internal sense bases) are not out there “in the world” producing images in a consciousness. Everything is included in “the all”, including the sense base pairs. A world beyond these sense bases is an object of speculation and thereby conceived of as another type of sense object (mental phenomenon) in the all.

The Buddha says:

*If anyone, bhikkhus, should speak thus: Having rejected this all, I shall make known another all - that would be a mere empty boast on his part. If he were questioned he would not be able to reply and, further, he would meet with vexation. For what reason? Because, bhikkhus, that would not be within his domain.*³⁶

³⁵ loc. cit.

³⁶ SN 35.23; Bodhi (2000).

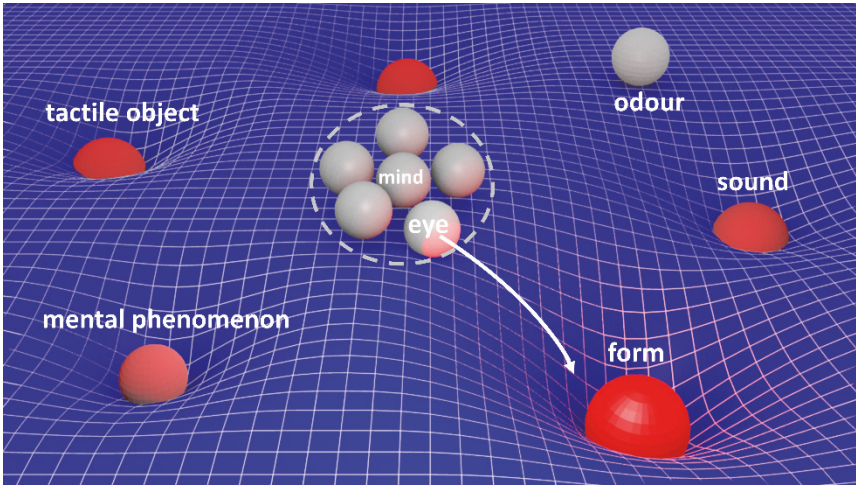


Figure 5.

Six senses, including the mind situated in the middle (internal sense bases), and six types of sense objects. A visible form is exerting a strong influence, dominating perception.

Programming

The five aggregates of grasping, namely form, feeling, perception, volition, and consciousness are shown in Figure 4. The following core statements describe the next steps in the process:

*What one perceives, that one thinks about. What one thinks about, that one mentally proliferates.*³⁷

Thinking is not a singular act, but rather it is continuous and repetitive.

*Bhikkhus, whatever a bhikkhu frequently thinks and ponders upon, that will become the inclination of his mind.*³⁸

Thus, thought rumination can increase the inclination in the *dukkha* potential field as shown in Figure 6a. Consider an internal sense base and paired external sense base with a weak inclination. In this circumstance, the sense object is perceived together with a weak feeling (weak coloring).

What one perceives, that one thinks about. Subsequently, if one engages in repetitive thoughts (represented by small balls in Fig. 6) with a positive interpretation (red color), the inclination of the *dukkha* potential field towards the sense object increases and the feeling associated with its perception strengthens (red hue intensifies), as shown in Figure 6b.

The repeated thoughts are related to each other and attribute value to the sense object. This history of thoughts then determines the *dukkha* potential that such an object will have the next time it is present.

Considering the same process in the opposite direction (Fig. 7), with a weak disinclination between the internal sense base and the external sense base, a weakly negative associated feeling (faint shadow) is perceived.

³⁷ MN 18; Nanamoli and Bodhi (1995).

³⁸ MN 19; op. cit.

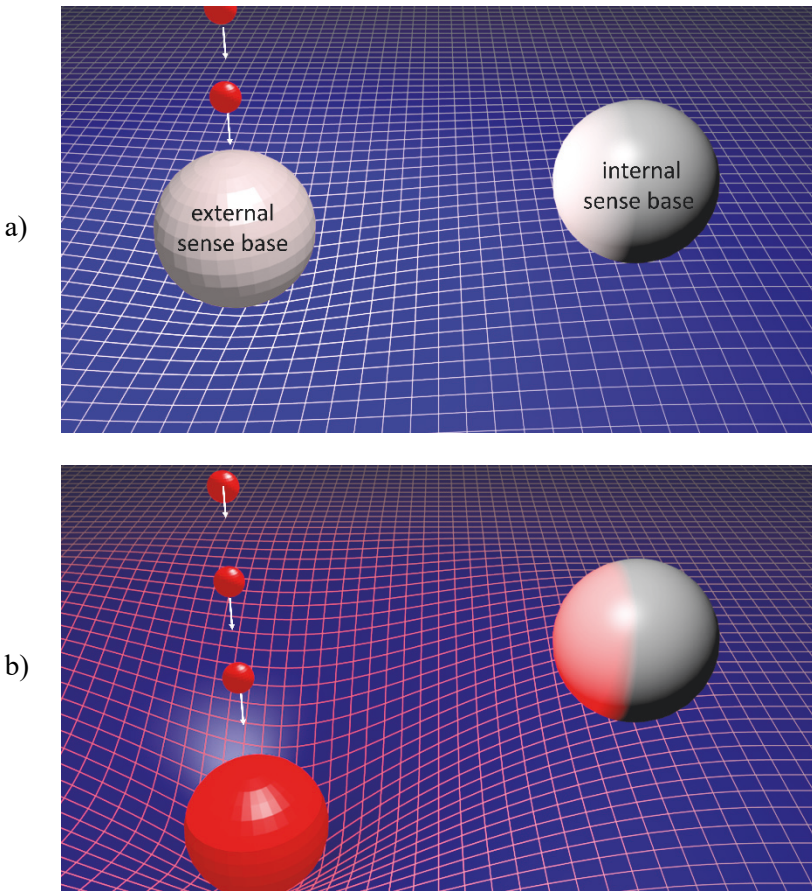


Figure 6.

Programming and reinforcement with an inclination.

a) Frequently thinking about and pondering (small balls) a sensual desire increases the inclination of the dukkha potential field (b).

What one perceives, that one thinks about. The re-enacted thoughts (represented by small balls) intensify the negative feelings associated with thought, increasing the opacity of the shadow in the model. Thus, as shown in Figure 7b, the resultant increased disinclination comes to be associated with a stronger feeling of aversion.

Of course, it is possible to have a positive association with a painful sense object: a bitter medicine is good for healing. Therefore, a disinclination can be reduced by a positive assessment of the sense object. The same is true for a negative rating and a pleasant sense object: sweet and greasy food may be tasty but they are unhealthy.

Repetitive thinking and pondering can be conceived of as a process of clinging. The Buddha says about a person without mindfulness:

On seeing a form with the eye, he lusts after it if it is pleasing; he dislikes it if it is unpleasing. [...] Engaged as he is in favouring and opposing, whatever feeling he feels—whether pleasant or painful or neither-painful-nor-pleasant—he delights in that feeling, welcomes it, and remains holding to it. As he does so, delight arises in him. Now delight in feelings is clinging.³⁹

Delighting in painful feelings may seem to be counterintuitive, but it is a common tendency for people to put themselves into distressing situations to reinforce their sense of ego.⁴⁰ In this way, the bipolar constellation is stabilized.

When a person perceives a pleasant or unpleasant sense object, it is connected to a pleasant or unpleasant feeling. These feelings are welcomed together with other sense objects associated with the same type of feeling. With repetition, this process reinforces the object-feeling association, creating a feedback loop.

³⁹ M 38; Nanamoli and Bodhi (1995).

⁴⁰ op. cit., p. 1232.

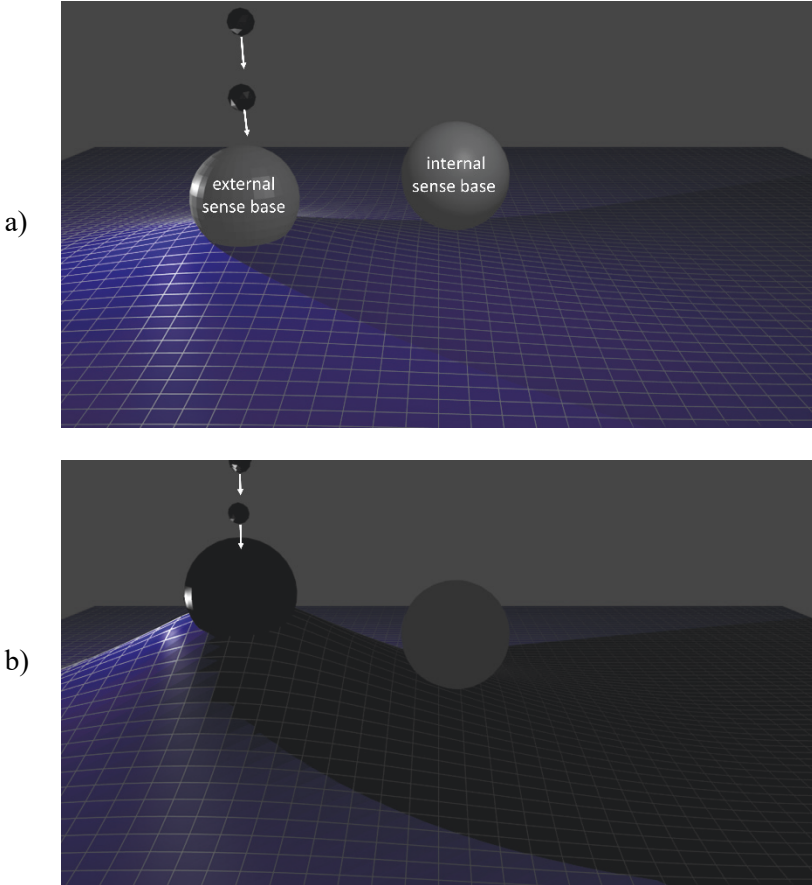


Figure 7.

Programming and reinforcement with a disinclination.

a) Frequently thinking about and pondering an unpleasant sense object increases the disinclination of the dukkha potential field (b).

In a feedback loop, part of the output is fed back as new input, which can modify and improve the subsequent output of a system.⁴¹ Consequently, when a similar pleasant or unpleasant sense object shows up later, the inclination towards it or the disinclination from it is stronger. In this way, reinforcement and programming go hand in hand.

⁴¹ Aström and Murray (2008).

Experiments with the Model

In accordance with the scientific method, experiments can be performed with the model to test how well the model matches everyday experiences and what outcomes occur when a particular element is manipulated.⁴² In Figure 8a, there is a sense object exerting a weak attraction upon the internal sense base. When a second sense object with a higher attraction force is present, the internal sense base is attracted to this new object (Fig. 8b). Thus, the model indicates that a stronger impression is dominant. This competition between sense objects fits with everyday experience. For example, if a digestive biscuit and a luxury chocolate are next to each other on a plate, most people will take the luxury chocolate because it is more attractive.

The volition resulting from the interaction of attractive and repulsive sense objects with the internal sense base is expressed by the gradient of the *dukkha* potential. This gradient depends on the difference in *dukkha* potential associated with the internal and external sense bases and their distance.

The influence of distance is illustrated in Figure 9. Beyond a given distance, there is negligible attraction affecting the internal sense base (Fig. 9a) because the gradient of the *dukkha* potential at the internal sense base site is almost zero. If a sense object is closer to the internal sense base, with the same *dukkha* potential difference, there is a stronger attraction force (Fig. 9b). For example, the draw of going to see a movie of interest is higher when a cinema playing it is located around the corner compared to when it is in another city.

⁴² Gaugh (2003).

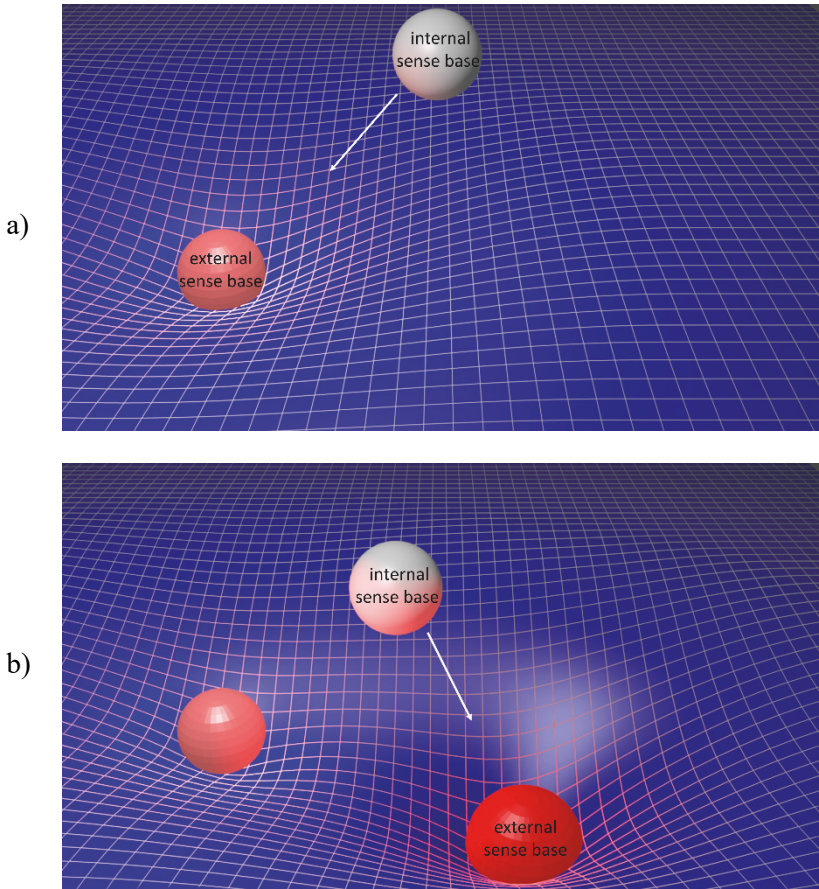


Figure 8.

Sense objects: weak and strong.

- a) A weak sense object (external sense base) makes a weak impression and exerts a weak attraction on the internal sense base.*
- b) A second sense object makes a stronger impression and dominates the attraction.*

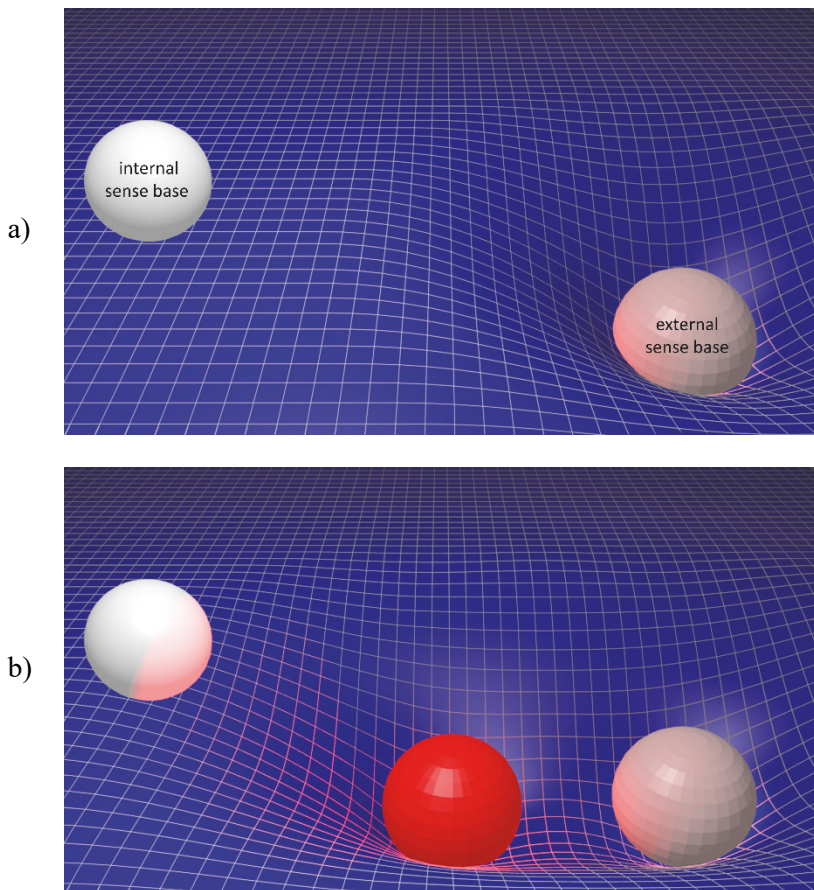


Figure 9.

Different distances between internal and external sense bases

- a) Due to the large distance, there is almost no attraction between the pleasant sense object and the internal sense base.*
- b) Another sense object with a smaller distance to the internal sense base exerts a stronger attraction.*

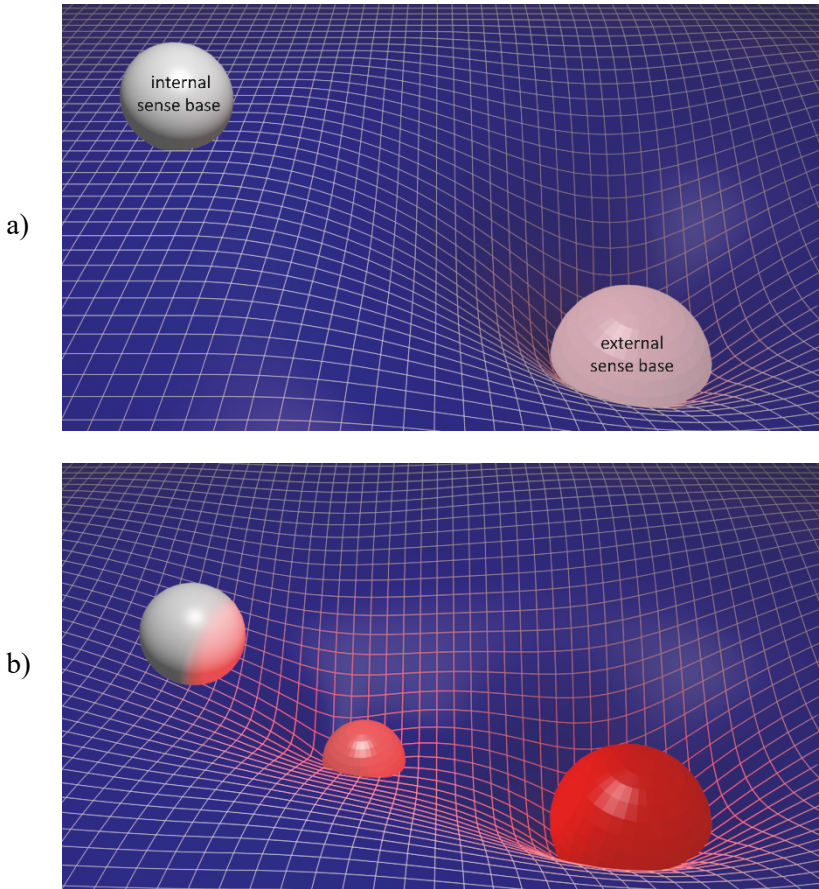
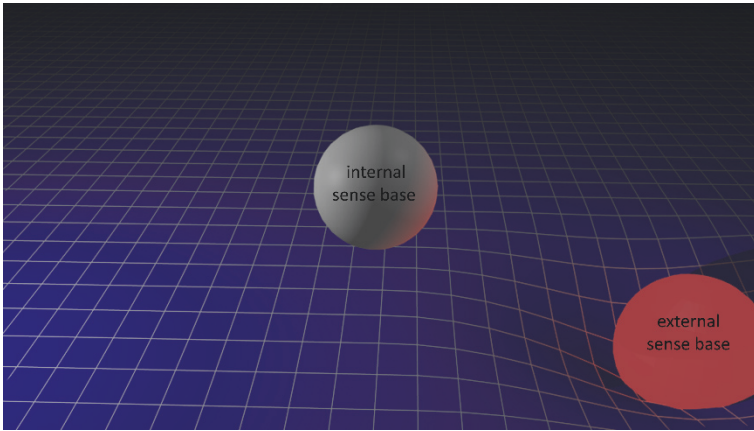


Figure 10.

Building a continuous inclination.

- a) A pleasant sense object exerting almost no attraction on the internal sense base due to a large distance.*
- b) Distance between internal and external sense bases can be broken down by an additional, intermediate sense object, which itself makes a relatively small impression.*

a)



b)

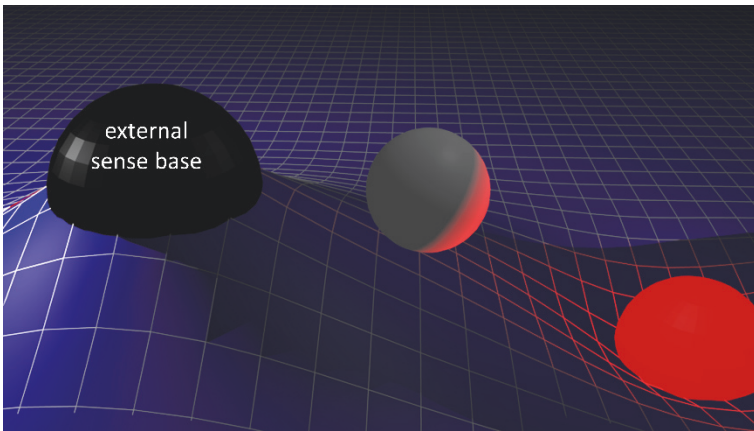


Figure 11.

Carrot and stick mechanism.

- a) A pleasant sense object causes only a small attraction of the internal sense base.*
- b) An additional external sense base (unpleasant sense object) increases the slope of the dukkha potential field. Volition is enhanced by repulsion by the unpleasant sense object concurrent with attraction of the pleasant sense object.*

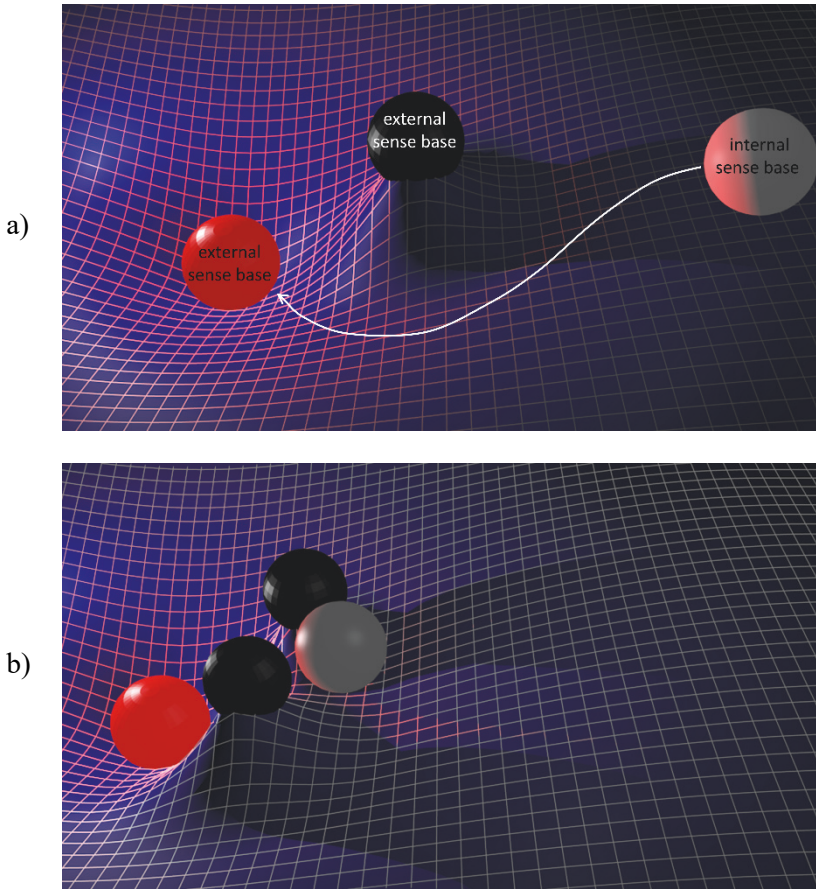


Figure 12.

Attractive sense object and obstacles.

- a) The internal sense base is attracted by a pleasant sense object and has the possibility to move around an obstacle (unpleasant sense object).*
- b) Due to the gradient of the dukkha potential field, the obstacles cannot be circumvented.*

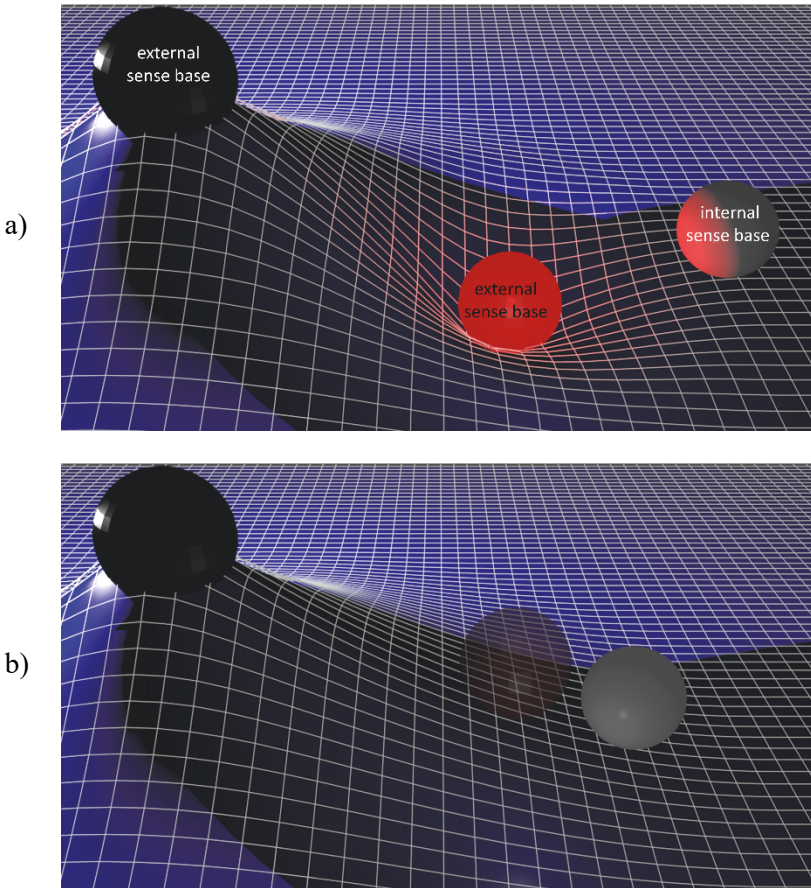


Figure 13.

Pleasure-seeking and regret.

- a) *A pleasant sense object (promise of pleasure) is associated with an unpleasant sense object in the form of knowledge of an impending consequence. Due to the different distances between the internal and external sense bases, the attraction dominates volition over the repulsion effect.*
- b) *When the attractive sense object has vanished (e.g. by consumption), the repulsion and the feeling of the negative consequence remain.*

Remember that in the model distance can represent distance in physical space, time, or a variety of other experienced dimensions. This mechanism can also be applied deliberately relative to one's motivation to reach an attractive goal, as shown in Figure 10a.

A disconnection of volition between an internal and an external sense base can be bridged by introducing an intermediate external sense base, such as a milestone on the way to a grand goal, which by itself is attractive even if its own *dukkha* potential is not highly pronounced. Thus, such intermediate sense bases can be used to produce a continuous gradient of *dukkha* potential, exerting an attraction force on the internal sense base (Fig. 10b). "Well begun is half done."

Conversely, the volition associated with a weak attraction towards a sense object (Fig. 11a) can be enhanced by the addition of a repulsive force from the opposite direction (Fig. 11b). This circumstance is akin to the so-called carrot and stick mechanism of combining two ways to motivate a donkey, the pleasant promise of a carrot in front, and the threat of a stick behind.⁴³

If a repulsive sense object is located between the internal sense base and an attractive sense object, it acts as an obstacle. With an amenable gradient of the *dukkha* potential, an obstacle can be circumvented (Fig. 12a). However, there are constellations of obstacles that can block the approach pathway towards an attractive sense object (Fig. 12b).

A pleasure can be associated with a negative consequence. For example, a chocolate bar or confectionery can be an attractive sense object that leaves one with regret after overindulging. In Figure 13, a scenario with pleasure and regret is presented. First, the attraction of the pleasant sense object is stronger than the repulsion from the impending consequence of gaining weight (Fig. 13a). After consuming it, thoughts of regret and shame are left as mental sense objects with a negative feeling (Fig. 13b).

⁴³ Andreoni, Harbaugh and Vesterlund (2003); Clarke (2005).

Love and *Mettā*

Mettā is translated as love, amity, sympathy, friendliness, or active interest in others.⁴⁴

However, in common use, the word love encompasses various forms, ranging from deep interpersonal affection to a love of cars or smoked pork.⁴⁵ Love directed towards a pleasant sense object is described by the model in Figure 14a, wherein there are internal and external sense bases and a *dukkha* potential gradient between them. Volition in this case is given by this gradient. Erotic love can be represented with this type of model, where the external sense base is another person and the result is attraction and sexual desire. In contrast to these volition-producing forms of love, *mettā*, or “loving-kindness”, is directed towards all beings, free of selfish attachment, attraction, and repulsion. The Buddha says:

*“... to all as to himself, he abides pervading the all-encompassing world with a mind imbued with loving-kindness, abundant, exalted, immeasurable, without hostility and without ill will.”*⁴⁶

With loving-kindness, there is no volition directed toward another being as a sense object because, in the *mettā* state, I and you merge in the wish “*May all beings be happy at heart.*”⁴⁷ The heart is cultivated limitlessly with regard to all beings including oneself.⁴⁸ The model requires an adaptation to describe such a situation. What is considered as “I” is connected to the internal sense base. Other beings appear as external sense bases. When both merge, the distance in the space of consciousness vanishes and there is no gradient of the *dukkha* potential between “I” and “you”. Consequently, there is no longer attraction or repulsion, but rather another kind of love, *mettā*, which works to overcome the bipolar constellation.

⁴⁴ Rhys Davids and Stede (1992).

⁴⁵ Colman (1994).

⁴⁶ MN 7; Nanamoli and Bodhi (1995).

⁴⁷ Sn 1.8; Thānissaro (2016).

⁴⁸ loc. cit.

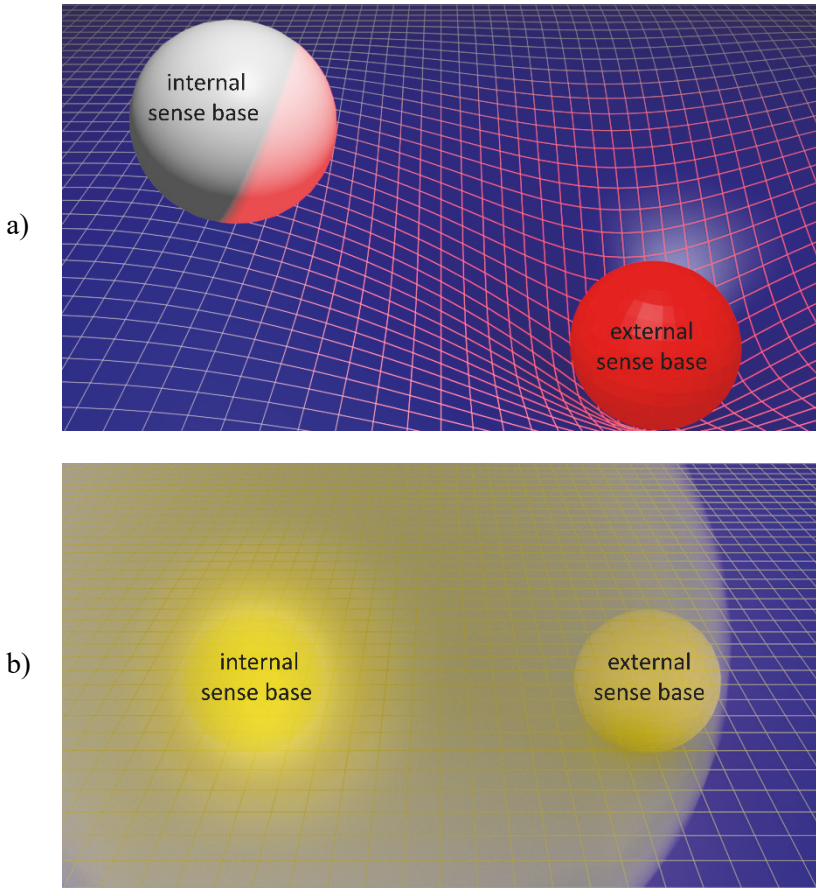


Figure 14.

- a) *Worldly love, such as erotic love: the external sense base is an attractive being that arouses desire.*
- b) *Mettā: the pole given by the internal sense bases expands and encompasses the external sense object representing the other being. “I” and “you” merge and the bipolar constellation starts to be overcome.*

In Figure 14b, the pole given by the internal sense base expands and encompasses the external sense object representing the other being. Whereas a worldly feeling is represented by a red color (Fig. 14a), the feeling connected with the state of *mettā* is supramundane. Therefore, I attribute a golden color to it (Fig. 14b). In the *mettā* state, specific features of the world model are lost, including distinct poles of the internal and external sense bases and thus all *dukkha*-potential gradients. Such a state in its fully realized form does not belong to this world but rather to a heavenly realm. *This is called a Brahmā abiding here.*⁴⁹

The End of the world

In the Anguttara Nikaya, the Buddha explains the world.

*“These five objects of sensual pleasure are called ‘the world’ in the Noble One’s discipline. What five? Forms cognizable by the eye ... sounds cognizable by the ear ... odors cognizable by the nose ... tastes cognizable by the tongue ... tactile objects cognizable by the body ... ”*⁵⁰

The Buddha continues by declaring how one can reach the end of the world by entering deep states of *jhāna*.

*“Secluded from sensual pleasures ... a bhikkhu enters and dwells in the first jhāna - This is called a bhikkhu who, having come to the end of the world, dwells at the end of the world.”*⁵¹

The *jhāna* state is reached in deep meditation as described in the *Ānāpānasati Sutta*⁵²:

The meditator starts out being aware of long and short inhalations and exhalations; he or she experiences the whole body of breath, and tranquilizes the breath. Four of the five senses are shut down (the eye, the ear,

⁴⁹ loc. cit.

⁵⁰ AN 9.38; Bodhi (2012).

⁵¹ loc. cit.

⁵² MN 118; Nanamoli and Bodhi (1995).

the nose, the tongue), leaving the body with only the feeling of touch and of breathing. On that occasion, the meditator abides contemplating the body.⁵³

The peaceful breathing leads to the experience of the “beautiful breath” with rapture (*pīti*) and pleasure (*sukha*).⁵⁴ Figure 15a shows the breath as the object of the fifth sense in the first-person perspective (as in Fig. 2b).

The unworldly feeling of the “beautiful breath” with *pīti-sukha* is represented by the golden color. On that occasion, the meditator abides contemplating feelings.

When *pīti* and *sukha* are experienced, the fifth sense base, touch, starts to shut down (Fig. 15b). After shutting down completely, the feeling of *pīti-sukha* remains, and the world model becomes entirely golden as in Fig. 15c). From the beautiful breath, all that is left is “the beautiful”.⁵⁵ On that occasion, the meditator abides contemplating the mind.⁵⁶

After *the five objects of sensual pleasure, which constitute 'the world',* have disappeared, the meditator is at the end of the world, entering the state of the first *jhāna*. This experience is beyond the scope of a world model. As becomes clear in Figure 15, the transition into a *jhāna* state puts the model out of service.

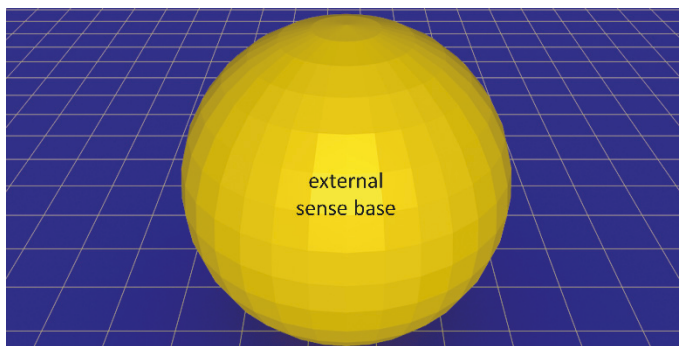
⁵³ loc. cit.

⁵⁴ Brahm, 2006, p. 89.

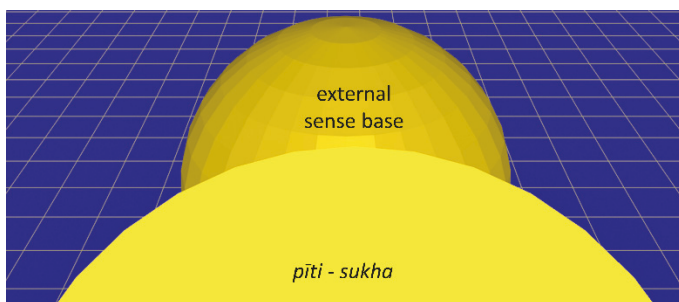
⁵⁵ Brahm (2006) p. 17.

⁵⁶ MN 118; Nanamoli and Bodhi (1995).

a)



b)



c)



Figure 15.

Transition into jhāna.

- a) The breath as an object of the fifth sense in the first-person perspective.*
- b) Pīti and sukha are experienced. The fifth sense base, touching, starts to shut down.*
- c) From the beautiful breath, all that is left is “the beautiful”.*

Conclusion and Outlook

The world model of the Buddha is a translation of the five aggregates of grasping (*pañcupadanakkandha*) at the core of the First Noble Truth. It is helpful to establish an understanding of the process-like character of form, feeling, perception, volition, and consciousness. The appearance of a person is described on the level of impersonal conditioned phenomena, as mechanics.

The model operates based on a *dukkha* potential field, which is opened by pairs of internal and external sense bases. Pleasant and unpleasant sense objects are defined by *dukkha* potential differences between internal and external sense bases. The meaning of volition is derived from the model as a *dukkha* potential gradient that provides a driving force underlying attraction and repulsion between sense bases. Inclinations and disinclinations in the *dukkha* potential field are the result of a programming process of repetitive thinking and pondering. Experiments with the model confirm its functionality.

In the *mettā* state, internal and external sense bases merge. Such a state does not belong to this world but to a heavenly realm. The transition into *jhāna* is the end of the world and puts the model elements out of service.

To be sure, this model is not a complete representation of the target system, and cannot develop a full comprehension of the teaching of the Buddha.

Reading the *suttas* is also a model building process. To understand the target system fully, it is not sufficient to compare different models: an elephant is not found by a comparative study of winnowing baskets and brooms. The blind men would only perceive an elephant upon gaining their eyesight, a transformational process.

According to the teachings of the Buddha, transformation and a deep understanding of the target system are found on the Eightfold Path. Someone who is already on this Path does not need a scientific model. But to approach this

Path, it might be helpful for natural science oriented readers to gain trust towards this target system based on a rational understanding of a model and the realization of the scientific clarity of the *suttas*. Traveling the Eightfold Path, one can then explore whether the claim is justified:

*The Dhamma is well expounded by the Blessed One, directly visible, immediate, inviting one to come and see, applicable, to be personally experienced by the wise.*⁵⁷

⁵⁷ AN 11.12; Bodhi (2012).

References

- AN 1.45, Pali, Paṇihitaacchavagga, Aṅguttara Nikāya 1, Retrieved January 7, 2019 from <https://suttacentral.net/an1.41-50/pli/ms>
- AN 1.45, English, A Spike, Numbered Discourses 1, Retrieved January 7, 2019 from <https://suttacentral.net/an1.41-50/en/sujato>
- AN 1.45-46, English, Udakarahaka Suttas: A Pool of Water, Retrieved January 7, 2019 from <https://www.accesstoinsight.org/tipitaka/an/an01/an01.045-046.than.html>
- AN 3.15, Pali, Sacetanasutta, Rathakāravagga, Aṅguttara Nikāya 3, Retrieved January 7, 2019 from <https://suttacentral.net/an3.15/pli/ms>
- AN 3.15, English, Pacetana, The book of the threes, Aṅguttara Nikāya, Retrieved January 7, 2019 from <https://suttacentral.net/an3.15/en/bodhi>
- AN 4.63, Pali, Brahmasutta, 7. Pattakammavagga, Aṅguttara Nikāya 4, Retrieved January 7, 2019 from <https://suttacentral.net/an4.63/pli/ms>
- AN 4.63, English, Living with Brahmā, 7. Deeds of substance, Numbered Discourses 4, Retrieved January 7, 2019 from <https://suttacentral.net/an4.63/en/sujato>
- AN 5.28, Pali, Pañcaṅgikasutta, 3. Pañcaṅgikavagga, Aṅguttara Nikāya 5, Retrieved January 7, 2019 from <https://suttacentral.net/an5.28/pli/ms>
- AN 5.28, English, Five-Factored, the book of the fives, Aṅguttara Nikāya, Retrieved January 7, 2019 from <https://suttacentral.net/an5.28/en/bodhi>
- AN 6.55, Pali, Soṇasutta, 6. Mahāvagga, Aṅguttara Nikāya 6, Retrieved January 7, 2019 from <https://suttacentral.net/an6.55/pli/ms>
- AN 6.55, English, With Soṇa, 6. The great chapter, Numbered Discourses 6, Retrieved January 7, 2019 from <https://suttacentral.net/an6.55/en/sujato>
- AN 9.38, Pali, Lokāyatikasutta, 4. Mahāvagga, Aṅguttara Nikāya 9, Retrieved January 7, 2019 from <https://suttacentral.net/an9.38/pli/ms>
- AN 9.38, English, Brahmin Cosmologists, 4. The great chapter, Numbered Discourses 9, Retrieved January 7, 2019 from <https://suttacentral.net/an9.38/en/sujato>

AN 11.12, Pali, Dutiyamahānāmasutta, 2. Anussativagga, Aṅguttara Nikāya 11, Retrieved January 7, 2019 from <https://suttacentral.net/an11.12/pli/ms>

AN 11.12, English, With Mahānāma, 2. Recollection, Numbered Discourses 11, Retrieved January 7, 2019 from <https://suttacentral.net/an11.12/en/sujato>

Andreoni, Harbaugh and Vesterlund (2003) The Carrot or the Stick: Rewards, Punishments, and Cooperation, *American Economic Review*, 93 (3): 893-902

Aström, Karl Johan and Murray, Richard M. (2008) *Feedback Systems*, Princeton, Princeton University Press

Bodhi, Bhikkhu (2005) *In the Buddha's Words*, Somerville: Wisdom Publications

Bodhi, Bhikkhu (2000) *The Connected Discourses of the Buddha*. Somerville: Wisdom Publications

Bodhi, Bhikkhu (2012) *The Numerical Discourses of the Buddha*. Somerville: Wisdom Publications

Bodhi, Bhikkhu (1999) *The Noble Eightfold Path - The Way to the End of Suffering*, Buddha Dharma Education Association Inc., Retrieved May 24, 2018, from http://www.buddhanet.net/pdf_file/noble8path6.pdf

Brahm, Ajahn (2006) *Mindfulness, Bliss, and Beyond*, Somerville: Wisdom Publications

Buckley B.C., Boulter C.J. (2000) Investigating the Role of Representations and Expressed Models in Building Mental Models. In: Gilbert J.K., Boulter C.J. (eds) *Developing Models in Science Education*. Springer, Dordrecht

Clarke, Marilyn (2005) The Voluntary Redundancy Option: Carrot or Stick? *British Journal of Management*, Vol. 16, 245-251

Colman, Warren (1994) Love, Desire and Infatuation, *Journal of Analytical Psychology*, 39, 497-514

DN 2, Pali, 1. Rājāmacakathā, Sāmaññaphalasutta, Dīgha Nikāya 2, Retrieved January 7, 2019 from <https://suttacentral.net/dn2/pli/ms>

DN 2, English, I. Talk on Wanderers, 1. The All-embracing Net of Views, Long Discourses, Retrieved January 7, 2019 from <https://suttacentral.net/dn1/en/bodhi>

DN 16, Pali, Mahāparinibbānasutta, Dīgha Nikāya 16, Retrieved January 7, 2019 from <https://suttacentral.net/dn16/pli/ms>

DN 16, English, The Great Discourse on the Buddha's Extinguishment, Long Discourses 16, Retrieved January 7, 2019 from <https://suttacentral.net/dn16/en/sujato>

DN 22, Pali, Mahāsatipaṭṭhānasutta, Dīgha Nikāya 22, Retrieved January 7, 2019 from <https://suttacentral.net/dn22/pli/ms>

DN 22, English, The Longer Discourse on Mindfulness Meditation, Long Discourses 22, Retrieved January 7, 2019 from <https://suttacentral.net/dn22/en/sujato>

Frigg, Roman and Hartmann, Stephan (2018) "Models in Science", The Stanford Encyclopedia of Philosophy (Summer 2018 Edition), Edward N. Zalta (ed.), forthcoming URL = <https://plato.stanford.edu/archives/sum2018/entries/models-science/>

Gauch, Hugh G. (2003) Scientific method in practice, Cambridge University Press, Cambridge

Giere R.N. (1999) Using Models to Represent Reality. In: Magnani L., Nersessian N.J., Thagard P. (eds) Model-Based Reasoning in Scientific Discovery. Springer, Boston, MA

Godfrey-Smith, P. (2009); Models and fictions in science, Philosophical Studies, Volume 143, Issue 1, pp 101-116

Hamermesh and Landau, L. D. (2013) The Classical Theory of Fields, Elsevier Science Ltd, Oxford

Merali, Yasmin (2000) The Organic Metaphor in Knowledge Management, Emergence, 2:4, 14-22

MN 7, Pali, Vatthasutta, Majjhima Nikāya 7, Retrieved January 7, 2019 from <https://suttacentral.net/mn7/pli/ms>

MN 7, English, The Simile of the Cloth, Majjhima Nikāya 7, Retrieved January 7, 2019 from <https://suttacentral.net/mn7/en/bodhi>

MN 18, Pali, Madhupiṇḍikasutta, Majjhima Nikāya 18, Retrieved January 7, 2019 from <https://suttacentral.net/mn18/pli/ms>

MN 18, English, The Honey-Cake, Middle Discourses 18, Retrieved January 7, 2019 from <https://suttacentral.net/mn18/en/sujato>

MN 19, Pali, Dvedhāvitakkasutta, Majjhima Nikāya 19, Retrieved January 7, 2019 from <https://suttacentral.net/mn19/pli/ms>

MN 19, English, Two Kinds of Thought, Majjhima Nikāya 19, Retrieved January 7, 2019 from <https://suttacentral.net/mn19/en/bodhi>

MN 22, Pali, Alagaddūpamasutta, Majjhima Nikāya 22, Retrieved January 7, 2019 from <https://suttacentral.net/mn22/pli/ms>

MN 22, English, The Simile of the Snake, Majjhima Nikāya 22, Retrieved January 7, 2019 from <https://suttacentral.net/mn22/en/bodhi>

MN 38, Pali, Mahātaṇhāsāṅkhayasutta, Majjhima Nikāya 38, Retrieved January 8, 2019 from <https://suttacentral.net/mn38/pli/ms>

MN 38, English, The Greater Discourse on the Destruction of Craving, Majjhima Nikāya 38, Retrieved January 8, 2019 from <https://suttacentral.net/mn38/en/bodhi>

MN 43, Pali, Mahāvedallasutta, Majjhima Nikāya 43, Retrieved January 8, 2019 from <https://suttacentral.net/mn43/pli/ms>

MN 43, English, The Great Analysis, Middle Discourses 43, Retrieved January 8, 2019 from <https://suttacentral.net/mn43/en/sujato>

MN 95, Pali, Caṅkīsutta, Majjhima Nikāya 95, Retrieved January 8, 2019 from <https://suttacentral.net/mn95/pli/ms>

MN 95, English, With Cankī, Majjhima Nikāya 95, Retrieved January 8, 2019 from <https://suttacentral.net/mn95/en/bodhi>

MN 99, Pali, Subhasutta, Majjhima Nikāya 99, Retrieved January 8, 2019 from <https://suttacentral.net/mn99/pli/ms>

MN 99, English, With Subha, Middle Discourses 99, Retrieved January 8, 2019 from <https://suttacentral.net/mn99/en/sujato>

MN 101, Pali, Majjhima Nikāya 101, Devadahasutta, Majjhima Nikāya 101, Retrieved January 8, 2019 from <https://suttacentral.net/mn101/pli/ms>

MN 101, English, At Devadaha, Middle Discourses 101, Retrieved January 8, 2019 from <https://suttacentral.net/mn101/en/sujato>

MN 118, Pali, Ānāpānassatisutta, Majjhima Nikāya 118, Retrieved January 8, 2019 from <https://suttacentral.net/mn118/pli/ms>

MN 118, English, Mindfulness of Breathing, Majjhima Nikāya 118, Retrieved January 8, 2019 from <https://suttacentral.net/mn118/en/bodhi>

MN119, Pali, Kāyagatāsatisutta, Majjhima Nikāya 119, Retrieved January 8, 2019 from <https://suttacentral.net/mn119/pli/ms>

MN 119, English, Mindfulness of the Body, Middle Discourses 119, Retrieved January 8, 2019 from <https://suttacentral.net/mn119/en/sujato>

MN 129, Pali, Bālapaṇḍitasutta, Majjhima Nikāya 129, Retrieved January 8, 2019 from <https://suttacentral.net/mn129/pli/ms>

MN 129, English, The Foolish and the Astute, Middle Discourses 129, Retrieved January 8, 2019 from <https://suttacentral.net/mn129/en/sujato>

Nanamoli, Bhikkhu, and Bodhi, Bhikkhu (1995) *The Middle Length Discourses of the Buddha. A New Translation of the Majjhima Nikaya*. Somerville: Wisdom Publications

Rhys Davids, T. W., and Stede, W. (1992) *Pali-English Dictionary*. Oxford: The Pali Text Society

SN 1.8, Pali, Susammutṭhasutta, 1. Naḷavagga, Saṃyutta Nikāya 1, Retrieved January 8, 2019 from <https://suttacentral.net/sn1.8/pli/ms>

SN 1.8, English, Utterly Muddled, Saṃyutta Nikāya 1, Connected Discourses with Devatas, Retrieved January 8, 2019 from <https://suttacentral.net/sn1.8/en/bodhi>

SN 1.12, Pali, Nandatisutta, 2. Nandanavagga, Saṃyutta Nikāya 1, Retrieved January 8, 2019 from <https://suttacentral.net/sn1.12/pli/ms>

SN 1.12, English, Delight, Saṃyutta Nikāya 1, Connected Discourses with Devatas, Retrieved January 8, 2019 from <https://suttacentral.net/sn1.12/en/bodhi>

SN 22.56, Pali, Upādānaparipavattasutta, 6. Upayavagga, Saṃyutta Nikāya 22, Retrieved January 8, 2019 from <https://suttacentral.net/sn22.56/pli/ms>

SN 22.56, English, Phases of the Clinging Aggregates, Saṃyutta Nikāya 22, Connected Discourses on the Aggregates, Retrieved January 8, 2019 from <https://suttacentral.net/sn22.56/en/bodhi>

SN 35.23, Pali, Sabbasutta, 3. Sabbavagga, Saṃyutta Nikāya 35, Retrieved January 8, 2019 from <https://suttacentral.net/sn35.23/pli/ms>

SN 35.23, English, The All, Saṃyutta Nikāya 35, Connected Discourses on the six sense bases, Retrieved January 8, 2019 from <https://suttacentral.net/sn35.23/en/bodhi>

SN 35.247, Pali, Chappānakopamasutta, 19. Āsīvisavagga, Saṃyutta Nikāya 35, Retrieved January 8, 2019 from <https://suttacentral.net/sn35.247/pli/ms>

SN 35.247, English, The Simile of the Six Animals, Saṃyutta Nikāya 35, Connected Discourses on the six sense bases, Retrieved January 8, 2019 from <https://suttacentral.net/sn35.247/en/bodhi>

SN 36.12, Pali, Paṭhamaākāśasutta, 2. Rahogatavagga, Saṃyutta Nikāya 36, Retrieved January 8, 2019 from <https://suttacentral.net/sn36.12/pli/ms>

SN 36.12, English, The Sky, Saṃyutta Nikāya 36, connected discourses on feeling, Retrieved January 8, 2019 from <https://suttacentral.net/sn36.12/en/bodhi>

SN 56.11, Pali, Dhammacakkappavattanasutta, Saṃyutta Nikāya 56, 2. Dhammacakkappavattanavagga, Retrieved January 8, 2019 from <https://suttacentral.net/sn56.11/pli/ms>

SN 56.11, English, Setting in Motion the Wheel of the Dhamma, Saṃyutta Nikāya 56, connected discourses on the truths, Retrieved January 8, 2019 from <https://suttacentral.net/sn56.11/en/bodhi>

Thanissaro, Bhikkhu (2012) Udāna: Exclamations, A Translation, Retrieved May 24, 2018, from <https://www.accesstoinsight.org/lib/authors/thanissaro/udana.pdf>

Thanissaro, Bhikkhu (2016) Sutta Nipāta, Retrieved May 24, 2018, from <https://www.dhammadata.org/Archive/Writings/SuttaNipata160803.pdf>

Ud 6.4, Pali, 4. Paṭhamanānātitthiyasuttaṃ, 6. Jaccandhavaggo, Udāna, Retrieved January 7, 2019 from http://www.palikanon.com/pali/khudaka/udana/ud_6.htm

Ud 6.4, English, 4. Sectarians, 6. Blind from Birth, Udāna, Retrieved January 7, 2019 from <https://www.accesstoinsight.org/tipitaka/kn/ud/ud.6.04.than.html>

Walshe, Maurice (1995) *The Long Discourses of the Buddha*, Somerville: Wisdom Publications

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About the Author

Until his retirement in 2018, Prof. Dr. Meinhard Knoll was a full professor at the University of Münster, Germany, where he researched and taught in the field of chemical sensorics (artificial senses). He is also an independent researcher studying the interrelationship of senses and consciousness as described in the Buddhist Pali Canon.

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The World Model of the Historical Buddha

Meinhard Knoll

This work presents the world model of the historical Buddha that represents the five aggregates of grasping, which form the core of the First Noble Truth in Buddhism. The model operates based on a dukkha potential field, with pairs of internal and external sense bases. The magnitudes of attractive and repulsive influences of pleasant and unpleasant sense objects, respectively, are defined by their dukkha potentials. Volition is derived from the model as the gradient of the dukkha potential providing the driving forces of attraction and repulsion. Inclinations and disinclinations in the dukkha potential field are a result of a programming process by repetitive thinking and pondering. Experiments with the model confirm its functionality. Internal and external sense bases merge in the metta state of loving-kindness, and the transition into a meditative jhana state puts the model elements out of service. This model is a novel translation from the Pali Canon that provides scientific clarity of the suttas and addresses natural science-oriented readers.

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