SURFISM

The fluid foundation of consciousness

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Optic flow

Portrayed metaphorically as a breaking wave, the mind emerges from optic flow–the confluence of spatial and temporal relations that constantly transforms the appearance of one's immediate surroundings. While its basic function is to situate the agent in space, the observer's perspective vacillates between the spatial and temporal paradigms.[1] Too much of the spatial paradigm causes the individual to see himself as an object. Too much of the temporal paradigm makes him oblivious to his circumstances. The individual needs to balance the two paradigms, to be able to act decisively in circumstances that continually change.[2]

The ability to shift one's perspective toward the spatial end of the scale might have evolved for self-defence. A clear sense of your own physical presence is vital when faced by danger. But, not all dangers threaten physical harm, especially in the modern world, where reputation stands for so much. If we subscribe to a mask and that mask is removed, we are confronted by an existential void. It can be terrifying to peer into the abyss.[3] But, it only feels threatening when we look at it objectively. As paradoxical as it seems, the fluid present is the only truly stable perspective. In essence, the problem is not the void, but the perspective that renders it objectively.

The most basic assumption we have about objective reality is our own spatially derived presence, whereby our surroundings provide the context for our own presence.[4] Neurologists point to the *posterior superior parietal lobe*–the portion of the brain Newberg and D'Aquili have dubbed the orientation association area, or OAA:

> "The primary job of the OAA is to orient the individual in physical space-it keeps track of which end is up, helps us judge angles and distances, and allows us to negotiate safely

> the dangerous physical landscape around us. To perform this crucial function, it must first generate a clear, consistent cognition of the physical limits of the self. In simpler terms, it must draw a sharp distinction between the individual and everything else, to sort out the you from the infinite not-you that makes up the rest of the universe."[5]

In their best-seller, *Why God Won't Go Away*, they suggest that reduced neural activity in the OAA during transcendence indicates a deficit condition resulting from a lack of information processing:

> "Would the orientation area interpret its failure to find the borderline between the self and the outside world to mean that such a distinction doesn't exist? In that case, the brain would have no choice but to perceive that the self is endless and intimately interwoven with everyone and everything the mind senses. And this perception would feel utterly and unquestionably real." [6]

However, by assuming that the spatial limits of the self are the *absolute* limits of the self, they overlook the key attribute of transcendence, which is the heightened sense of immediacy. They fail to acknowledge that the brain has to first generate a perspective from which to interpret the spatial boundary of the self.[7]

One's perspective emerges from optic flow; those movements in the scenery that are attributed to one's own movement. Newborn babies detect optic flow in a simulated setting, moving their legs[8] as if they are stepping into the world. So, we obviously have an innate understanding of spatio-temporal relations. In essence, the mind uses these movements for the sake of determining one's moving perspective. Since the correlation between these movements and one's own motion is immediate, the relationship between them contributes to one's sense of immediacy. However, while our perspective resides in the present moment, the interpretation of space suppresses our experience of

the present moment by harnessing our perspective to navigate space. The mechanism that renders the world as spatial does so at the expense of our own immediacy.[9]

We use a variety of cues to perceive depth; motion is only one of many. One of the most powerful cues to depth, especially at short distances, is binocular disparity, the difference in the images received by each eye. Additionally, we make use of accommodation, the thickening and thinning of the lens of the eye to better focus on near and far objects respectively. Additionally, we use a number of pictorial cues to depth, such as the fact that nearer objects occlude further objects (occlusion), nearer objects are larger than further objects (relative size) and are further from the horizon (relative position).

Although motion is not the only means by which depth is interpreted, it distinguishes itself from all other depth cues by virtue of its temporality. Depth variations revealed by motion are determined across time. The mind determines the shape of an object, or an empty space, based on how its appearance changes over time. These changes in appearance only make sense to the extent that they are relative to the observer's perspective.[10] So, the process of determining depth through motion effectively harnesses the observer's perspective, with the result that our sense of immediacy is dulled.

Space seems like a solid foundation for presence, however, it is not as fundamental as it seems. As far as perception is concerned, it is a façade that masks the fluidity of one's perspective. Paradoxically, this fluidity is more resilient than space, because it is the foundation for spatial perception. Through meditation it is possible to retract one's awareness from the world, and in so doing dissolve the division between one's perspective and the object of one's attention, such that one's very perspective becomes the object.[11] Then, one does not see the surroundings so much as the movements in the surroundings that indicate one's own motion. Subject and object merge and the here-and-now becomes palpable.

The "sharp distinction between the individual and everything else" only applies to our spatial presence. Our immediacy extends

beyond this boundary. The so-called inner and outer worlds are intertwined within our consciousness.[12] One's perspective emerges from the changing appearance of *one's surroundings* and the so-called "outer" reality only gains its spatial character from the projection of *one's own presence*. What emerges from this discussion, however, is the distinction between spatial and temporal relations, where space is in fact 'imagined' and the nature of transcendence extends beyond our physical boundary.

While it is perfectly sensible to treat the world as objectively present, the spatial paradigm is by definition divisive.[13] By contrast, the temporal paradigm is inclusive. However, the nature of this connection is not to be understood in spatial terms. It sounds absurd to say that: "the self is endless and intimately interwoven with everyone and everything the mind senses" without first dissolving the spatial paradigm. It infers that the mind is misinterpreting its relationship to the world. On the contrary, during transcendence, the mind perceives the foundation of its own presence. The extraordinary connection felt during meditation doesn't just feel real it is real. But it is a connection to the present moment, rather than the physical world as such.

Spatial perception *takes shape* within the fluid movement of one's own visual perspective. Just as a wave changes shape as it enters shallow water, vision converges with the visible to render spatial relations. The confluence of movements coalesces to give us the impression of form in our surroundings. Motion determines the observer's perspective, which detects the spatial relations that situate the observer.[14] There are thus two directions of causation: a feed-forward from motion to space and a feedback from space to motion. The observer's perspective rides the interface between space and motion. By emphasising the temporal component of situated presence, the surfing analogy lays the ontological groundwork for a functional model of the psyche, characterising the spatio-temporal structure of experience as a subliminal template for how we see the world.

Emergence

The interface between surfboard and wave exhibits the same dynamic structure as spatial perception. Firstly, the shape of the wave represents *optic flow*, in the sense that waves respond to the shape of the reef in the same way *optic flow* responds to the shape of one's surroundings. Secondly, the penetration of the surfboard corresponds to depth perception, in the sense that the interplay between wave and surfboard is analogous to the interplay between movements that reveal the depth of space to the observer. In effect, the surfboard penetrating the surface of the wave can be likened to spatial features penetrating the apparent motion of *optic flow*.

The mind emerges from the confluence of these spatial and temporal relations. As a representation of perception, the shape of the wave is analogous to the access afforded by perception to the available information**:** the hollower the wave, the deeper the access, the more information to draw on. Since the shape of the wave is influenced by both the depth and shape of the reef, these two factors represent either end of a spatio-temporal continuum; the reef inducing spatial relations and depth temporal relations. Consequently, fluctuation in the tide represents the relative proportions of each, with low tide triggering more spatial than temporal relations and high tide triggering more temporal than spatial relations. At high tide, waves break less intensely, reflecting the reduced influence of the reef on wave shape. Somewhere between these two extremes, spatial and temporal relations blend in such a way as to produce an optimal shape for surfing.

Tidal variation affects the surf in a similar way to how serotonin affects the mind. At low tide, waves encounter an abrupt incline in bathymetry, causing the crest of each wave to rise suddenly, just as low levels of serotonin result in hypersensitivity, causing sudden over-reactions. Serotonin promotes patience[15], which ensures that memories have time to reach the surface, where they can help shape current experience.

The role of serotonin is opposed by dopamine[16], which promotes action. These two neurotransmitters interact in ways that correspond to the interaction between surfboard and wave. Basically, dopamine provides the motivation to pursue a reward, like the shape of a surfboard affects how it responds to the wave. The relationship between Serotonin and Dopamine determines the appropriate timing of a response. Where reward is concerned, a rapid response is not always beneficial, since patience might be needed to assess the situation before advancing toward the object of desire. Similarly, where risk of injury is concerned, the timing of one's response is critical to the outcome. The interplay between serotonin and dopamine is akin to surfing insofar as reaction times are encoded, like the shape of the surfboard and the bathymetry of the surf break, to facilitate performance.

Since the response of the surfboard is derived simultaneously from the surfboard and the wave, the act of surfing represents a spatio-temporal continuum (like wave shape is influenced by the depth and shape of the reef), in this case, with the surfboard inducing spatial relations and the wave temporal relations. As a representation of the intellect, the penetration and release phases of a manoeuvre are analogous to concentration and contemplation, in the sense that concentration is active, while contemplation is passive. Actively engaging the wave invokes spatial relations, because the surfboard—its shape and motion—is the primary factor influencing where it is going. This is the penetration phase of a manoeuvre, when the surfboard rotates into the water. Passively engaging the wave invokes temporal relations, because the surfboard follows a track determined more by the shape and motion of the wave than by the shape and motion of the surfboard. This is the release phase of a manoeuvre, when the surfboard rotates out of the water. In the same way that surfing manoeuvres are composed of alternating phases of penetration and release, ideas emerge from alternating phases of concentration and contemplation. Imagination negotiates a tension between reason and perception[17] in the same way surfing manoeuvres negotiate a tension between the shape of the surfboard and the shape of the

wave. The task of designing a surfboard requires insight into how this tension between surfboard and wave influences surfing performance.

The metaphor can even be applied to the coupling of different frequencies in the brain, such as gamma waves riding theta waves. This interaction is thought to be necessary for goal-directed activities.[18] It is also believed to be instrumental in assembling global networks of brain activity, whereby large areas of the brain become synchronized by slow rhythms coordinating high frequency oscillations.[19] For example, synchronisation is evident in visual attention and motion awareness,[20] where the process of coordinating spatio-temporal relations corresponds to a surfboard manoeuvring on a wave that is breaking on a reef.

Movement

Only actively moving creatures evolved a nervous system. So, the evolution of consciousness might have resulted from the brain internalising movement.[21] The process of internalisation can be seen in shark embryos, which undulate rhythmically inside the egg to ensure the even distribution of oxygen necessary for tissue development. At this stage of development, the movement is generated solely by the muscle cells, which have not yet been innervated by motoneurons. When the motoneurons migrate from the spinal cord to the muscles, the electrotonic coupling of muscle cells ceases, so that the brain can take control of motricity. Then the motility properties of the muscles become embedded into the neuronal circuits of the spinal cord, where they are integrated into the vestibular system, which monitors the effects of inertia acting on the organism through gravity and momentum.

Rhythmic movement is coordinated by central pattern generators, which alter the interneuronal pathways.[22] Simply visualising a motor skill can modify the neural substrates for its physical performance.[23] Mental practice is encoded into the neural networks, strengthening the same activation patterns triggered by

the physical training. Visualisation is frequently used by performers to hone their skills. Even muscle strength increases, i.e. without the physical activity you would think was necessary for muscle growth.[24] This undermines the notion of a metaphysical plane of consciousness, suggesting instead that the mind has evolved out of the structural coherence of consciousness and physiology.

Morphogenesis

The development of spatial structure in the embryo has been found to involve a chemical reaction that is analogous to standing waves.[25] Using a staining technique, morphogenesis can be seen in the early embryo, in the form of a periodic banded pattern. This pattern indicates alternating concentrations of morphogens, which chemically mark the tissue, identifying which cells belong together. The mechanism, known as *reaction diffusion*, involves a continuous process whereby morphogen P catalyses the production of more morphogen P, plus morphogen S, which inhibits morphogen P. The physiological development of the organism is thus marked out, distinguishing bones, muscles, internal organs, etc. Camouflage patterns have also been attributed to *reaction diffusion*.[26] The stripes of the zebra and the spots of the leopard show how morphogenesis exploits periodicity for evolutionary advantage. The extent to which this process is analogous to standing waves is easily appreciated when comparing patterns of animal skin colouration and sand vibrating on a steel plate. The sand accumulates at the nodes of vibration, to reveal the geometric character of the harmonic resonance. Many patterns found in living organisms can be replicated in this way.

The underlying argument is that the evolution of biological form is founded on generic physical forces, which presumably served as morphological templates within which genetic selection could operate. While the similarity between so many physical and organic forms suggests such a connection, the case is rather more

compelling if one considers that many organisms have morphological features that are similar to physical forms despite being genetically unrelated. For example, a 3D logarithmic spiral found in seashells is also evident in tidal-washed kelp fronds and in the shape of our own skin pores.[27]

Natural patterns and processes are often applied to the development of new technology. This approach to design, called *Biomimicry*, enables designers to take advantage of the millions of years of incremental variations that have been made through biological evolution, to gain insight into the underlying principles determining naturally evolved shapes. For example, a highly efficient fan blade has been designed using the 3D logarithmic spiral, common throughout the natural world, because this shape optimises the flow of water or gas across its surfaces.[28]

As with naturally evolved shapes, the activity of design draws on the spatio-temporal structure of Being, to produce something new that extends the experience of Being.[29] On this basis, the surfboard designer's ability to invoke the link between spatial and temporal relations validates the surfing metaphor as a tool for visualising the spatio-temporal structure of experience.

Extension

It's hard to describe to non-surfers how it feels to carve across a wave, to push the limits of your surfing ability and to surf even better than you thought you could. One surfs *with* the wave, drawing on experience to manoeuvre the surfboard in synchrony with the wave, all the while anticipating how it will change shape.[30] As a nexus of past, present and future experience, surfing corresponds to Kant's model of the intellect, which portrays information as the product of three types of synthesis: the apprehension of raw perceptual input, the recognition of concepts and the reproduction of each in imagination.[31] Viewed in these terms, the principles of surfboard design show how the spatio-temporal structure of surfing can represent the spatio-temporal

structure of experience.

To analyse how a surfboard responds to a surfer's movements, the designer reduces the surfer's influence to a set of rotational axes. Focusing on the surfboard, he ignores the shape and motion of the wave, which is subsequently reduced to a flat plane. At this level of abstraction, the surfer's influence can be represented diagrammatically, enabling the designer to more easily visualise the different phases of a manoeuvre, as well as the transitions between them. By visualising each phase in terms of its rotational axis, or sequence of axes, the designer can identify which portions of the surfboard come into play for a given manoeuvre.

We can visualise rotational axes in terms of lines of latitude and longitude encircling the globe:

1. The first rotational axis traces a circle on the horizontal plane, which can be thought of as the Equator.
2. The second rotational axis traces a circle on any vertical plane; which can be visualised as the lines of longitude encircling the globe from north to south.
3. The third rotational axis traces a circle at right angles to each of the other two.

So long as the surfboard rotates on the first axis, its interaction with the wave has no effect. This is a *monadic* relation, defined solely by the wave, which represents perception. Rotating on the second axis causes the surfboard to penetrate the wave, which produces a *dyadic* relation between the surfboard and the wave, with their intersection representing the recognition of concepts. When all three rotational axes combine, *monadic* and *dyadic* relations are absorbed into *triadic* relations–representing their synthesis in imagination–expressed as the variable of direction, in the sense of the surfboard traversing the surface of the wave.

The surfboard shaper is the Sufi of naval architects; adjusting the shape of the surfboard while simultaneously invoking the sensation of its movement through the water. This connection between shape and motion is key to the surfboard being absorbed

into the surfer's movements. A poorly designed surfboard makes it hard to read the wave, which is akin to the failure of *mirror neurons* to read the intention behind an action, as occurs in autism.[32] Unable to engage meaningfully with other people, autistic individuals struggle to make sense of the world. And yet, autistic savants seem to perceive the very fabric of the universe! So, in terms of the surfing analogy, the autistic savant surfs within the wave, like a dolphin, experiencing 'reality' directly, instead of through the medium of a surfboard. By contrast, the non-autistic mind adopts a detached perspective, which the surfing analogy equates with riding on the surface of the wave. Moreover, we are able to detect the intention behind an action, because it is encoded by *mirror neurons*, like the various trajectories of surfing manoeuvres encoded into the design of a surfboard.

Language

The interaction of surfboard, wave and seabed provides a dynamic framework for modeling how the mind operates. For example, we can imagine language riding the mind like a surfer riding a wave. According to this analogy, the act of surfing represents linguistic expression, with the shape of the wave representing the range of meanings that can be expressed.

Characterising the various sounds that form speech, the penetration and release phases in surfing are analogous to *obstruents* and *sonorants*. *Obstruents* are produced by obstructing the airflow against a range of articulation points within the vocal tract. By contrast, *sonorants* are produced without obstructing airflow through the vocal tract. Since *obstruents* and *sonorants* alternate like the penetration and release phases of surfing, speech is analogous to the surfer's repertoire of manoeuvres, with each angle of resistance corresponding to a particular sound.

Numerous sounds remind us of shapes. This is classically demonstrated by the *Kiki and Bouba* experiment.[33] In this experiment, a drawing of two aliens is presented (see fig.1). The

subject is asked to identify which alien is *Kiki* and which is *Bouba*.

The vast majority of respondents identify *Kiki* as the pointy shaped alien and *Bouba* as the rounded one—indicating that our perception of sound and shape overlaps. This form of cross modal perception is analogous to the surfboard designer's ability to associate the shape of a surfboard with its response during surfing manoeuvres. The sound of the word "kiki" is more closely associated with sudden changes in direction, as depicted by the drawing of a spiky figure. By contrast, the sound of the word "bouba" is more closely associated with long, drawn out turns, as depicted by the drawing of a curvaceous figure.

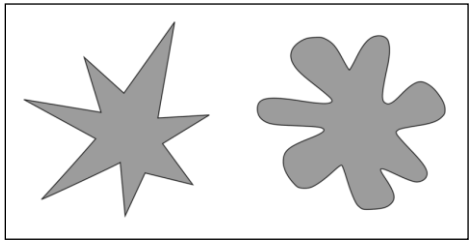

Figure 1. Kiki & Bouba.

The stimulation in one modality that triggers sensations in another is called *synaesthesia*. For example, a synaesthete may consistently experience a specific colour when hearing a particular tone or looking at a certain numeral. Mild forms of *synaesthesia* permeate consciousness, as revealed by the sounds *Kiki* and *Bouba*, which invoke an association with shape. Colours are also mixed with sounds, as indicated by the polysemous word "tone", with low pitch sounds linked to dark colours and high pitch with light colours.[34] Dance could be regarded as a form of *synaesthesia*, in this case sensory-to-motor, where the rhythm of physical movement mimics the auditory rhythm.[35] Even the design skills of a surfboard shaper could be regarded as sensing a synaesthetic link, in this case, between surfing manoeuvres and the shape of the surfboard.

As a form of motor-to-sensory *synaesthesia*, the surfboard

shaper's skill is probably underpinned by *mirror-neurons*; so-named because they fire in response to movements that share a common trajectory,[36] whether performed by you or someone else. *Mirror neurons* are believed to be implicated in learning to speak. They facilitate the transfer of skills, e.g. from parent to child, by coding movements in terms of their purpose. As a result, the mind learns how to deal with objects through their use, which is fundamentally different to their spatial presence, since the use of an object extends the self beyond its physical limits.

To design a surfboard as an extension of the self, the surfboard shaper has to decipher surfing manoeuvres in terms of spatial and temporal relations. The various axes of penetration and release represent the set of alternatives from which manoeuvres are composed, just as the letters of an alphabet are combined to form words. The similarity between the movements of surfing and the movements of speech is evident in passages that employ *onomatopoeia*, where the sound of a word, or group of words, seems to characterise its meaning. For example, the following passage demonstrates the perceptual overlapping of sound and movement:

> True ease in writing comes from art, not chance,
> As those move easiest who have learned to dance,
> 'Tis not enough no harshness gives offense,
> The sound must seem an echo to the sense.
> Soft is the strain when Zephyr gently blows,
> And the smooth stream in smoother numbers flows,
> But when loud surges lash the sounding shore,
> The hoarse, rough verse should like the torrent roar,
> When Ajax strives some rock's vast weight to throw,
> The line too labors, and the words move slow;
> Not so, when swift Camilla scours the plain,
> Flies o'er the unbending corn, and skims along the main.
>
> Alexander Pope (1711)

The sense of movement invoked by *onomatopoeia* is analogous to

the perceptual overlapping required to design a surfboard. Firstly, the set of speech sounds is analogous to the set of curves present in a surfboard. Secondly, the sense of movement induced by the speech sounds is analogous to manoeuvring the surfboard. In both language and surfing, the (temporal) sequence connects the components that are (spatially) separated from alternatives. Just as the components of language are assembled to generate speech sounds in the vocal tract, the components of surfboard design are assembled to generate manoeuvres on a wave. Moreover, the meaning of the poem is analogous to the order of execution, since this displays the surfer's understanding of the wave, which is analogous to our understanding of context.

Since meaning derives from context, the curvature in the surface of the wave is analogous to the access afforded by language to the contents of the mind—the hollower the wave, the deeper the access. Between the contents of the mind and the sounds we use to explore it, there is a yin-yang sort of struggle influencing what we 'make' of reality. Of course, reality can be experienced and represented in various modalities. But, there is always a tension between spatial and temporal relations.[37] This tension can be revealed by distorting the spatial and temporal relations, so that the perceptual structures become increasingly nonsensical. Consider, for example:

(1) Colourless green ideas sleep furiously.

This sentence is as nonsensical as a visual scene of a distant object appearing to be supported by a near object—such as the tiny man standing on an outstretched hand in figure 2. Although the objects are suitably positioned to produce the illusion, we know that tiny men do not exist, just as "Colourless green ideas sleep furiously" does not make sense. The gap in space between these objects corresponds to the gap in meaning between these words. Although they appear together, they do not belong together. The failure to choose suitable words in language corresponds to the failure to perceive depth in space.

Figure 2. A distant object appearing to be connected to a near object.

At the other end of the spatio-temporal continuum, sentences are composed of words that are semantically connected, but poorly arranged. For example:

(2) Dogs harmlessly young bark friendly.

This sentence could be likened to a portrait that repositions facial features in bizarre, yet still face-like assemblages, such as in figure 3. The elements seem to belong together, to the extent that they are semantically related. But, their order is distorted.

Figure 3. The temporal distortion of facial features.

Since (1) lacks spatial integrity and (2) lacks temporal integrity, they each sit at opposite ends of the continuum, with (1) at the temporal end and (2) at the spatial end. Of course, spatial and temporal relations are usually deployed to produce sensible utterances, by interacting to varying degrees, as per the notion of a continuum. The purpose of distorting them is to highlight the variables that serve to situate the mind within language.

Construal

Although nouns and verbs are traditionally characterised as polar opposites, they each divide into sub-categories on the basis of essentially the same schema.[38] The prototypical nouns and verbs correspond to isolated objects and events, because the role of categorisation is inherently spatial. Although we tend to characterise nouns as objects and verbs as events, count nouns and perfective verbs are no more valid than mass nouns and imperfective verbs. But, their spatial character sets them apart more clearly than their alternatives would. Langacker agrees on this point, stating that:

> "Viewed as nodes in a network, category members are discrete. … The nodes of a network are invariably visualised spatially as fully disjoint, i.e. separate and non-overlapping. … It would however be unrealistic to suppose that they are wholly distinct at the level of cognitive processing."[39]

If we equate count nouns with the perception of spatial relations, their construal might also separate the perceiver from the entity perceived, as happens with spatial relations. And a corresponding correlation between mass nouns and the perception of temporal relations might, conversely, suspend this detachment of the perceiver in order to highlight quality, by invoking temporal presence as the archetype of quality. Both mechanisms stem from spatial perception, but emphasise opposite aspects of the process, i.e. spatial versus temporal presence.

The link between quality and temporal presence (versus quantity and spatial presence) is also evident in verbs, where perfective verbs profile an event and imperfective verbs profile a state. Events are inherently temporal, so perfective verbs carry a sense of transition from one state to another, e.g. fall, jump, kick, bite, throw and break. Since these verbs represent processes involving two states, they are perceived in a spatial context, which

separates the perceiver from the event perceived. By contrast, a single state is inherently atemporal, e.g. know, believe, like, love, detest and appreciate. Unlike perfective verbs, imperfective verbs induce a sense of quality by invoking the perceiver's temporal presence.

Langacker suggests that the distinction between count and mass nouns, and perfective and imperfective verbs, is derived from our inability to detect boundaries at a distance:

> "(W)hen viewing a collection from an increasingly greater distance, there comes a point when we can no longer distinguish individuals, and thus perceive them as a continuous mass."[40]

> "The registration of contrast makes possible the detection of a *boundary*…." and that boundary is the "crucial property differentiating count and mass nouns, as well as perfective and imperfective verbs."[41]

No doubt, the spatial character of count nouns and perfective verbs stems from boundary detection. But, the perceptual process responsible for distinguishing count and mass nouns, as well as perfective and imperfective verbs, is not spatial in the sense of being near or far away, but spatial *perception* in the sense of spatial versus temporal presence.

Basically, the spatial metaphor is inadequate because it takes temporality for granted. If the spatial character of count nouns and perfective verbs stems from the boundary detection of *form* (as opposed to mere contrast), it seems plausible that the role of motion in depth perception would be pivotal in distinguishing count nouns from mass nouns and perfective verbs from imperfective verbs. Although combined in spatial perception, temporal presence and spatial presence are *a priori* experiences, which language is able to draw on separately.

Categorisation seduces us with concepts that are neatly packaged to aid the transfer of information. Of course, it suits our

everyday circumstances to subscribe to concepts. But, the natural world does not reveal itself through concepts.[42] On the contrary, it is concealed by them.[43] The next section takes a detailed look at this problem and proposes a radically different way of seeing reality.

Dimensions

Spatial perception sets motion in the context of space, to provide a sense of motionlessness - a sort of reference to show how motion differs to it. For example, we typically regard motion as a change of position, a reference to something fixed. But as a consequence, motion is seen as a movement *in* space when it is actually a movement *of* space - a space in motion.[44]

The spatially derived model of reality is based on how the dimensions differ to each other. Space is characterised by the difference between a plane and space. The planes set the context for the idea of space. The edges of a plane provide a context by showing the line where the plane ceases to be a plane. The difference between a line and a plane is what the concept of a plane is based on. To visualise a line, we give it ends. Each end of the line is a point and together they serve as the context for the line. They show the difference between a line and a point, and in this way they define the point at which a line ceases to be a line.

Successive dimensions build on lesser dimensions; for example, a line as a series of points. So, each dimension can be 'placed' within dimensions higher than itself, but not lower than itself. However, while this is clear for each of the dimensions leading up to the three dimensions of space, it is not so clear how time 'contains' its lesser dimensions. The problem is the spatially derived model of reality. We understand the passing of time to be in relation to the present moment, as if the 'now' has no duration. We supposedly experience a string of nows. However, it is only for sake of the concept that the passage of time differs to the present. The contrast does not reflect reality, but the setting of a

context.

What the concept of time fails to take into account is that successive dimensions merge. They are not discrete. Each dimension carries within it the dimensions lesser than it. So, instead of focusing on how the dimensions differ to each other, we should look at how they differ in themselves. This reveals that the essence of a point is its location, the essence of a line is its alignment, the essence of a plane is its form, and the essence of a space is its density.

In considering how a motion differs in itself, one is tempted to describe it in linear terms: i.e. the path it follows. But this is not its essential quality, since a line has just one dimension, not four. Neither can we narrow it down to its location, form or density, though that which moves certainly has these characteristics too. But all these things being equal (imagine two identical movements side by side), there remains one characteristic which belongs solely to motion: its speed. This is how motion differs in itself - making speed the essence of motion.

The variable of speed is beyond the ordinary conception of motion, so we tend to regard it as inconsequential. But motion in the sense of speed is precisely how it ties in to reality. This can be observed in the shape of a wave. It is not simply that the form would not exist without motion, but that the variable of speed determines the variety of curves in a wave. A standing wave behind a rock in a stream is a good example of this principle: the water flows through the wave while the form expresses the various speeds at which the water is moving.

The whirlpool is a particularly good example because the dimensions are seen to be variables linked in a unified system. There is the alignment of its axis, the form of its surface, the matter it draws inward and, since a vortex rotates progressively faster toward its centre, the variable of speed. Placing a tiny pointer in a whirlpool can show the part played by motion. The pointer remains parallel to its original alignment, despite being carried around and around. This indicates that motion, rather than content, determines the form.[45]

The concept of time fails to account for the diversity of change, since the division of time and space implies that change is restricted to the 4th dimension. However, assuming that change is the very essence of reality, rather than a mere aspect of it, it follows that the essence of each dimension is how that dimension changes. By setting each dimension in the context of change, the concept of time subsequently loses its significance as one of the dimensions, as such, separated from space. To subordinate the dimensions to the concept of time ignores the crucial point that each dimension finds its expression in change and that change is, moreover, what holds them together.

Having reinstated motion as the 4th dimension, it becomes apparent that time is also a *generalisation* of change. Just as we tend to regard motion in terms of its lesser characteristics, so too do we have an inferior perception of that other form of change called growth. Since growth depends on but is more than motion, it might be a higher dimension, with evolution as its essence. After all, information is not physical. In effect, life rides the material properties of chemicals, using instructions stored in DNA to direct cell growth. Perhaps, information is itself a higher dimension.

Soul surfing

Waves carry energy like memories: the kinetic energy is stored in a chain of orbits, which taper into the depths. The orbiting particles are generated by the wind rippling the ocean surface. The more wind, the larger the wave, the deeper they reach. When the deepest orbits are compressed against the seabed, the whole chain is squeezed upward, causing the wave to break, which can be likened to memories being released in response to a stimulus.

The entire reef could represent the memory bank of experience needed to interact in society—the cultural values within which the psyche develops. The integrity of the reef could then represent the satisfying sense that things fit together in the world. Conversely, traumatic memories could be represented by protruding sections of

reef that distort the wave, making it harder to ride.

Extending the analogy further, total disconnection from the wave could be characterised by two scenarios, each representing a disconnected state of mind. One is a wipeout followed by the threat of being dragged onto exposed reef. The other is the decision to abandon one surf break in search of another. In this scenario, paddling across the ominous depths would be equivalent to unfamiliar circumstances that cause you to feel disoriented because your awareness continues to be directed at the world, but without the familiar values that give it meaning. Since making sense necessarily involves values, this is as futile as trying to catch a swell in the open ocean. Meaning depends on culture, just as a breaking wave depends on the seabed. By contrast, getting dragged across the reef would represent a situation in which the individual is forced to confront unfamiliar circumstances.

The ability to deal with a situation is represented in the surfing analogy by the suitability of a surfboard design for the surfing conditions. The resulting ease of surfing corresponds to familiar circumstances, when the characteristics of a situation can be inferred without having to interpret every detail.[46] By contrast, when circumstances are unpredictable, the mind relies more on observation than expectation. The unfamiliarity of the situation demands more effort, because the individual is not suitably equipped to deal with the circumstances, which is like a surfer who struggles to ride an unsuitable surfboard. Ideally, the surfer adjusts his approach to the wave by reducing penetration, which reduces the influence of the surfboard upon direction. This is like trusting one's intuition—the surfer choosing to go with the wave instead of against it. No matter how successfully we reason our way through life, we cannot expect that 'our design' will meet every contingency.[47] There will be occasions when we require a deeper sense of direction, so that we can let go of reason and feel at ease with how ever things unfold.

Faith could even be characterised by free-falling down the face of a wave on take-off, when one's attention is momentarily suspended between interpreting the situation and anticipating

what's about to happen. The body knows what to do and responds accordingly. It has an innate relationship with the wave, which is like a relationship with God. The ego's perspective becomes disengaged from the task of making sense,[48] just like the surfboard becomes disengaged from the wave during a late take-off.

Surfers pay close attention to the weather, constantly assessing how different winds, swells and tides affect local surfing conditions. That is why surfers have traditionally regarded surfing to be more of a lifestyle than a sport. This aspect of surfing could represent selfhood as the product of cultivation; as opposed to its construction, depicted by the activity of surfing. In this mindset, circumstances are understood with an openness of mind in which the individual is content to merely dwell in the world, instead of trying to control it.[49] Luckily, good surf breaks can be found all over the world; so, surfers are able to feel this connection almost anywhere they go. The search for the perfect wave expands the horizon of dwelling to become an aesthetic journey, which is oriented more toward the wave as an object of worship than to surfing as a performance.

About the author

Dan Webber is one of the six Webber brothers, an Australian family of surfers, sculptors, filmmakers and designers, who have been making surfboards since the 1970s. *Webber Surfboards* are known throughout the surfing world, with a reputation built on high performance, innovative designs. Dan has also been involved in developing the *Webber Wave Pool*, a visionary enterprise reflecting the family's avant-garde values and uncompromising creativity. He has a master's degree in linguistics and publishes a literary magazine entitled *Bondi Stories*, based on the famous beach where he learnt to surf.

Dan riding a *Webber* single-fin, aged 14. Photo: Monty Webber

References

[1] Bergson, H. (1912). An Introduction to Metaphysics. G.P. Putnam's Son's, p.63.

> "[...] the intuition of our duration, far from leaving us suspended in the void, as pure analysis would do, brings us into contact with a whole continuity of durations which we must try to follow, whether downwards or upwards; in both cases we can extend ourselves indefinitely by an increasingly violent effort, in both cases we transcend ourselves. In the first we advance towards a more and more attenuated duration, the pulsations of which, being rapider than ours, and dividing our simple sensation, dilute its quality into quantity; at the limit would be pure homogeneity, that pure repetition by which we define materiality. Advancing in the other direction, we approach a duration which strains, contracts, and intensifies itself more and more; at the limit would be eternity. No longer conceptual eternity, which is an eternity of death, but an eternity of life. A living, and therefore still moving eternity in which our own particular duration would be included as the vibrations are in light; an eternity which would be the concentration of all duration, as materiality is its dispersion. Between these two extreme limits intuition moves, and this movement is the very essence of metaphysics."

[2] Tuan, Yi-Fu (1979). Space and place: Humanistic perspective, in Philosophy in Geography, Theory and Decision Library, Springer Netherlands, 20, p.419.

> "We owe our sense of being not only to supportive forces but also to those that pose a threat. Being has a centre and an edge: supportive forces nurture the centre while threatening forces strengthen the edge. In theological language, hell bristles with places that have sharply drawn - indeed fortified - boundaries but no centre worthy of defence; heaven is full of glowing centres with the vaguest boundaries; earth is an uneasy compromise of the two realms."

[3] Russell, B. (1950). The Autobiography of Bertrand Russell. Routledge. Prologue.

What I Have Lived For

Three passions, simple but overwhelmingly strong, have governed my life: the longing for love, the search for knowledge, and unbearable pity for the suffering of mankind. These passions, like great winds, have blown me hither and thither, in a wayward course, over a great ocean of anguish, reaching to the very verge of despair.

I have sought love, first, because it brings ecstasy–ecstasy so great that I would often have sacrificed all the rest of life for a few hours of this joy. I have sought it, next, because it relieves loneliness–that terrible loneliness in which one shivering consciousness looks over the rim of the world into the cold unfathomable lifeless abyss. I have sought it finally, because in the union of love I have seen, in a mystic miniature, the prefiguring vision of the heaven that saints and poets have imagined. This is what I sought, and though it might seem too good for human life, this is what–at last–I have found.

With equal passion I have sought knowledge. I have wished to understand the hearts of men. I have wished to know why the stars shine. And I have tried to apprehend the Pythagorean power by which number holds sway above the flux. A little of this, but not much, I have achieved.

Love and knowledge, so far as they were possible, led upward toward the heavens. But always pity brought me back to earth. Echoes of cries of pain reverberate in my heart. Children in famine, victims tortured by oppressors, helpless old people a burden to their sons, and the whole world of loneliness, poverty, and pain make a mockery of what human life should be. I long to alleviate this evil, but I cannot, and I too suffer.

This has been my life. I have found it worth living, and would gladly live it again if the chance were offered me.

[4] Todes, S. (2001). Body and World. MIT Press, p.168-9.

> "On our phenomenological account, however, the self-activity of the percipient is felt as the self-movement of his substantive. The fields in which this self-movement is directed are therefore felt as the fields of direction of the very body that is self moving."

[5] Newberg, A.B. & D'Aquili, E.G. (2001). Why God Won't Go Away: Brain Science and the Biology of Belief. New York: Ballantine Books, p.4.

[6] Ibid.

[7] Todes, S. (2001). Body and World. MIT Press, p.175.

> "Our general sense of activity is of something-or-other taking place in the field of our experience; and in practical perception, as we have seen, this field is a function of our sense of self-movement."

[8] Barbu-Roth, M., Anderson, D., Desprès, A., Provasi, J., Cabrol, D. & Campos, J.J. (2009). Neonatal Stepping in Relation to Terrestrial Optic Flow, *Child Development*, 80 (1), p.13.

> "The apparent ability of the newborn to discriminate an optic flow pattern specifying self-motion from one specifying stasis (the static pattern), or motion of an object in space (the pinwheel), suggests that a capacity for recognition of an implicit ecological self, as opposed to an interpersonal self (Neisser, 1991), is present from birth. In other words, the infant's behavior is relational; it is directed at a specific environmental demand, and the infant's behavior is differentiated in accordance with the task demand."

[9] Ibid., p.171.

> "In all empirical determination, therefore, we somehow make ourselves passive objects of our own spontaneity."

"By *active* self-movement, the percipient first generates his spatiotemporal field. But, as soon as he does so, he is *passively* thrown into the middle of it as an arena in which he must fend for himself as vulnerable, and seek to find himself, though subject to failure."

[10] Ibid., p.206.

"We can have an object in perception only by becoming circumstantially self-aware. And we become circumstantially self-aware by becoming aware of the existence of our active body in the center of our perceptual field of objects."

[11] Bergson, H. (1910). Time and Free Will: An Essay on the Immediate Data of Consciousness, Allen and Unwin, p.90.

"Representative sensation, looked at in itself, is pure quality; but seen through the medium of extensity, this quality becomes in a certain sense quantity, and is called intensity. In the same way, our projection of our psychic states into space in order to form a discrete multiplicity is likely to influence these states themselves and to give them in reflective consciousness a new form, which immediate perception did not attribute to them. Now, let us notice that when we speak of *time*, we generally think of a homogenous medium in which our conscious states are ranged alongside one another in space, so as to form a discrete multiplicity. Would not time, thus understood, be to the multiplicity of our psychic states what intensity is to certain of them, a sign, a symbol, absolutely distinct from true duration? Let us ask consciousness to isolate itself from the external world, and, by a vigorous effort of abstraction, to become itself again."

[12] Merleau-Ponty, M. (2002). Phenomenology of Perception. *Psychology Press*, p.474.

"Inside and outside are wholly inseparable. The world is wholly inside and I am wholly outside myself."

[13] Sartre, J. ([1960] 2000). Transcendence of the Ego: An

Existentialist Theory of Consciousness, Trans. F. Williams and R. Kirkpatrick. The Noonday Press, p.45.

> "Insofar as my reflecting consciousness is consciousness of itself, it is non-positional consciousness. It becomes positional only by directing itself upon the reflected consciousness which was not itself a positional consciousness of itself before being reflected."

[14] Todes, S. (2001). Body and World. MIT Press, p.128.

> "The percipient begins empty of content, lost in the world, having only the need for content. The percipient has to achieve fullness. He does this by determining a passing object. His activity in doing so acquires unity and specificity from the concrete unity of the object that he skilfully determines in this way. In the completed perceptual object, the percipient perceives a reflection of his own momentarily completed activity."

[15] Cools, R., Nakamura, K. & Daw, N.D. (2011). Serotonin and Dopamine: Unifying Affective, Activational, and Decision Functions, Neuropsychopharmacology Reviews, 36, p.105.

> "Time discounting is the subject of another prominent computational theory of serotonergic function (Doya, 2002), which posits that 5-HT [serotonin] controls (im)patience in intertemporal choice: the degree of preference for immediate rewards over delayed rewards. Specifically, Doya proposed that 5-HT controls a parameter common to many decision models known as the temporal discount factor according to which delayed rewards are viewed as less valuable than immediate ones, with higher 5-HT promoting greater patience."

[16] Dawa, N.D., Kakadeb, S. & Dayanb, P. (2002). Opponent interactions between serotonin and dopamine, *Neural Networks* 15, 603–616.

[17] Gabora, L. & Aerts, D. (2009). A model of the emergence and evolution of integrated worldviews. *Journal of Mathematical Psychology*, 53, 434-451.

> "The modern human mind has the ability to shift between analytic thought, conducive primarily to realizing relationships amongst states of a known concept, and associative thought, conducive primarily to forging new concepts through the formation of conjunctions, which are entangled states that result through application of the tensor product of the Hilbert spaces of the two constituent concepts. It is proposed that the penultimate step toward achieving an integrated worldview was to acquire the capacity to spontaneously focus attention (conducive to analytic thought) or defocus attention (conducive to associative thought) depending on the circumstance. This is modelled as onset of the modulation of μ, the transition probabilities using a variable we called Φ. Once the capacity has evolved to alter Φ according to the situation, analytic thought and associative thought can work in concert to organize and reorganize conceptual structure. Analytic thought enables the identification of causal relationships, while associative thought facilitates recognition of items in memory that are correlated, *i.e.* that share properties, which in turn provides more ingredients for analytic thought."

[18] Dürschmid, S., Zaehle, T., Kopitzki, K., Voges, J., Schmitt, F.C., Heinze, H., Robert, T., Knight, R.T. and Hinrichs, H. (2013). Phase-amplitude cross-frequency coupling in the human nucleus accumbens tracks action monitoring during cognitive control, *Frontiers in Human Neuroscience*, 7, p.11.

> "We investigated the dynamics of PAC in the human NAcc and show, that in the NAcc contralateral to a movement the θ phase modulates the high gamma amplitude (≈100–140Hz) following a motor response. Importantly, this previously undescribed oscillatory pattern in the human NAcc increases with cognitive control and predicts behavioral adaptation as reflected in the reduction in error rates."

[19] Buzsáki, G., and Draguhn, A. (2004). Neuronal oscillations in cortical networks. *Science*, 304, p.1929.

> "Slow rhythms synchronize large spatial domains and can bind together specific assemblies by the appropriate timing of higher frequency localized oscillations."

[20] Lamme, V.A.F. (2002). Why visual attention and awareness are different. *TRENDS in Cognitive Sciences*, 7 (1), pp.14-16.

[21] Llinas, R.R. (2001). I of the vortex: From neurons to self. A Bradford Book, MIT Press, p.18.

> "The nervous system has evolved to provide a plan, one composed of goal-oriented, mostly short-lived predictions, verified by moment-to-moment sensory input. This allows a creature to move actively in a direction according to an internal reckoning-a transient sensorimotor image-of what may be outside."

[22] Zehr, E.P. (2005). Neural control of rhythmic human movement: the Common Core Hypothesis. *Exercise and Sport Sciences Reviews*, 33 (1), p.56.

> "Extensive reorganization of neuronal circuits involved in the generation of many rhythmic motor patterns (e.g. chewing, gastric mill, pylorus, etc.) has been well documented, and is altered extensively by various neuromodulators. That is, neuromodulators alter the activation and synaptic efficacy in various interneuronal pathways, and allow for the expression of different motor patterns with essentially the same neurons."

[23] Pascual-Leone, A., Nguyet, D., Cohen, L.G., Brasil-Neto, J.P., Cammarota, A. & Hallett, M. (1995). Modulation of muscle responses evoked by transcranial magnetic stimulation during the acquisition of new fine motor skills. *Journal of Neurophysiology*, 74, p.1043.

> "Therefore, mental stimulation of movements activates some of the same central neural structures required for the performance

of the actual movements. In doing so, mental practice alone seems to be sufficient to promote the modulation of neural circuits involved in the early stages of motor skill learning."

[24] Ranganathan, V.K., Siemionowa, V., Liu J.Z., Sahgal, V. & Yue, G.H. (2004). From mental power to muscle power—gaining strength by using the mind. *Neuropsychologia*, 42, p.953.

"The key findings of this study were that mental training increases voluntary strength of both distal and proximal muscles of human upper extremities and the strength improvements accompanied elevations of time-locked (to MVC trials) cortical potential (MRCP). Based on the MRCP data, we are confident that the primary mechanism underlying the strength increase is a mental training-induced enhancement in the central command to muscle. The data suggest that repetitive mental attempts to maximal muscle activation trained and enabled the brain to generate stronger signals to muscle."

[25] Lehar, S. (2003). Harmonic Resonance Theory: An alternative to the "Neuron Doctrine" paradigm of neurocomputation to address gestalt properties of perception. *The Behavioral and Brain Sciences*, 26 (4), p.15.

"The utility of standing wave patterns as a representation of spatial form is demonstrated by the fact that nature makes use of a resonance representation in another unrelated aspect of biological function, that of embryological morphogenesis, or the development of spatial structure in the embryo."

[26] Ibid.

"After the initial cell divisions following fertilization, the embryo develops into an ellipsoid of essentially undifferentiated tissue. Then, at some critical point a periodic banded pattern is seen to emerge as revealed by appropriate staining techniques, shown in figure 3A. This pattern indicates an alternating pattern of concentration of morphogens, i.e. chemicals that permanently mark the underlying tissue for future development. This pattern is sustained despite the fact that the morphogens are free to

diffuse through the embryo. The mechanism behind the emergence of this periodic pattern is a chemical harmonic resonance known as reaction diffusion (Turing 1952, Prigogine & Nicolis 1967, Winfree 1974, Welsh et al. 1983) in which a continuous chemical reaction involving a morphogen P catalyzes the production of more morphogen P as well as of a morphogen S, but the concentration of morphogen S in turn inhibits production of morphogen P (see Gilbert 1988 pp 655-661 for a summary)."

[27] Pronk, A.D.C., Blacha, M. & Bots, A. (2008). Nature's Experiences for Building Technology, p.4.

[28] Ibid.

"Example of use of the pattern found in snail-shells, like the mollusk shells are the fans, propellers, impellers, and aerators designed by PAX Scientific (USA), see [1]. A three-dimensional logarithmic spiral is found in the shells of mollusks, in the spiraling of tidal-washed kelp fronds, and in the shape of our own skin pores, through which water vapor escapes. Liquids and gases flow centripetally through these geometrically consistent flow forms with far less friction and more efficiency."

[29] Palmer, K. (2006). On the Ontology of Emergent Design and General Schemas Theory: Research into The Deep Structure of Design, p.1.

"Dasein reacts to what has Being and produces something new, which extends and expands on what Being covers. In other words what Being covers is changed by the activity of Design."

[30] Flynn, P.J. (1987). Waves of Semiosis: Surfing's Iconic Progression. *The American Journal of Semiotics*. 5 (3), 398-418.

"[The surfer] employs perceptive prolepsis and analepsis to unify past surfing experience, present immediate interpretation, and projections of possible future unfoldings of the wave based on a reading of natural signs, such as the wave's speed, shape,

degree of breaking angle, steepness, and local contingencies, like other surfers on the wave or in the wave path. The surfer dances with the wave in a state of what Heidegger (1962:324) calls "anticipatory resoluteness" (past, present, future are unified). Manoeuvers and stylistic improvisations are accomplished in synchrony with the wave's movements, linked together artfully to create a completed narrative or a spatio-temporally synchronized "radical ride", e.g. a skilled cut-back is executed at the precise moment when the wave's speed begins to slacken. A tube ride is achieved by riding as far back as possible in the breaking wave. An off the lip manoeuver is carried out just as the breaking lip comes down. Contemporary "radical" surfing is the result of the surfer "pushing the limits" of performance while achieving semiotic synchrony with the wave's flow as it is perceived and interpreted by the wave rider."

[31] Kant, I. (1781). Critique of Pure Reason. (A97).

"If each representation were completely foreign to every other, as it were standing apart in isolation, there would be no such thing as knowledge; because knowledge is ·essentially· a whole in which representations stand compared and connected. what Kant wrote next, conservatively translated: When I ascribe to sense a synopsis [from Greek meaning 'view together'], because sense contains a manifold in its intuition, then there is always, corresponding to this synopsis, a synthesis [from Greek meaning 'put together']. Thus, receptivity can make knowledge possible only when combined with spontaneity. what he meant, more plainly put: Every sensory state contains a variety of different elements, which leads me to say that each such state involves a seeing-together. And corresponding to every seeing-together there is a putting-together. Thus, passive intake can make knowledge possible only when it is combined with something active. This activeness is exercised in three acts of synthesis that must occur in all knowledge:

a) apprehending representations as states of the mind in intuition,
b) reproducing them in imagination, and

c) recognizing them in a concept.

These three syntheses point to three subjective sources of knowledge which make possible the understanding itself—and consequently all experience as its empirical product."

[32] Gallese, V., Rochat, M. Cossu, G. & Sinigaglia, C. (2009). Motor Cognition and Its Role in the Phylogeny and Ontogeny of Action Understanding, *Developmental Psychology*, 45 (1), p.109.

"These results indicate that children with autism are impaired in smoothly chaining sequential motor acts within a reaching-to-grasp-to-eat intentional action sequence. This impairment is then mirrored in the action observation condition and most likely accounts for their difficulty in directly understanding the intention of the observed action when executed by others."

[33] Ramachandran, V.S., & Hubbard, E.M. (2001). Synaesthesia - A window into perception, thought and language. *Journal of Consciousness Studies*, 8 (12), p.19.

"If you show [the picture] to people and say 'In Martian language, one of these two figures is a "bouba" and the other is a "kiki", try to guess which is which', 95% of people pick the left as kiki and the right as bouba, even though they have never seen these stimuli before. The reason is that the sharp changes in visual direction of the lines in the right-hand figure mimics the sharp phonemic inflections of the sound kiki, as well as the sharp inflection of the tongue on the palate. The bouba/kiki example provides our first vital clue for understanding the origins of proto-language, for it suggests that there may be natural constraints on the ways in which sounds are mapped on to objects."

[34] Ward, J., Huckstep, B. and Tsakanikos, E. (2006). Sound-colour synaesthesia: To what extent does it use cross-modal mechanisms common to us all? *Cortex*, 42, p.279.

"In sum, our conclusion is that the type of sound-colour synaesthesia reported here is a genuine phenomenon in which

pitch heights map on to colours as a function of the lightness. We suggest that this variety of synaesthesia recruits normal mechanisms of cross-modal perception and attention and can therefore be used to speak to theories of normal cognition."

[35] Ramachandran, V.S., & Hubbard, E.M. (2001). Synaesthesia - A window into perception, thought and language. *Journal of Consciousness Studies*, 8 (12), p.19.

"Second, we propose the existence of a kind of sensory-to-motor synaesthesia, which may have played a pivotal role in the evolution of language. A familiar example of this is dance, where the rhythm of movements synaesthetically mimics the auditory rhythm. This type of synaesthesia may be based on cross- activation not between two sensory maps but between a sensory (i.e., auditory) and a motor map (i.e., Broca's area). This means that there would be a natural bias towards mapping certain sound contours onto certain vocalizations."

[36] Arbib, M.A. (2005). From monkey-like action recognition to human language: An evolutionary framework for neurolinguistics. *Behavioural and Brain Sciences*, 28 (2), p.112.

"During training, the output of the F5 canonical neurons, acting as a code for the grasp being executed by the monkey at that time, was used as the training signal for the F5 mirror neurons to enable them to learn which hand-object trajectories corresponded to the canonically encoded grasps. Moreover, the input to the F5 mirror neurons encodes the trajectory of the relation of parts of the hand to the object rather than the visual appearance of the hand in the visual field. As a result of this training, the appropriate mirror neurons come to fire in response to viewing the appropriate trajectories even when the trajectory is not accompanied by F5 canonical firing."

[37] Kierkegaard, S. ([1843] 1987). Either/Or, Part II, Trans. Howard V. Hong & Edna H. Hong, Princeton University Press, p.136.

"If one traces dialectically and just as much historically the development of the esthetically beautiful, one will find that the

direction of this movement is from spatial categories to temporal categories, and that the perfecting of art is contingent upon the possibility of gradually detaching itself more and more from space and aiming toward time. This constitutes the transition and the significance of the transition from sculpture to painting, as Schelling early pointed out. Music has time as its element but has no continuance in time; its significance is the continual vanishing in time; it sounds in time, but it also fades and has no continuance. Ultimately poetry is the highest of all the arts and therefore also the art that best knows how to affirm the meaning of time. It does not need to limit itself to the moment in the sense that painting does; neither does it disappear without a trace in the sense that music does. But despite all this, it, too, is compelled, as we have seen, to concentrate in the moment. It has, therefore, its limitation and cannot, as shown above, portray that of which the truth is precisely the temporal sequence. And yet this, that time is affirmed, is not a disparagement of the esthetic; on the contrary, the more this occurs, the richer and fuller the esthetic ideal becomes."

[38] Langacker, R. (2008). Cognitive Grammar, Oxford University Press, p.128.

[39] Langacker, R. (2006). On the continuous debate about discreteness. *Cognitive Linguistics*, 17-1, p.141.

[40] Ibid., p.111.

[41] Ibid., p.113.

[42] Bergson, H. (1912). An Introduction to Metaphysics. G.P. Putnam's Son's, p.36.

"... a true empiricism is that which proposes to get as near to the original itself as possible, to search deeply into its life, and so, by a kind of intellectual auscultation, to feel the throbbings of its soul; and this true empiricism is the true metaphysics. It is true that the task is an extremely difficult one, for none of

the ready-made conceptions which thought employs in its daily operations can be of any use."

[43] Heidegger, M. (1962). Being and Time, trans. John Macquarie and Edward Robinson. New York: Harper & Row, p.43.

> "When tradition thus becomes master, it does so in such a way that what it 'transmits' is made so inaccessible, proximally and for the most part, that it rather becomes concealed. Tradition takes what has come down to us and delivers it over to self-evidence; it blocks our access to those primordial 'sources' from which the categories and concepts handed down to us have been in part quite genuinely drawn. Indeed it makes us forget that they have had such an origin, and makes us suppose that the necessity of going back to these sources is something which we need not even understand."

[44] Bergson, H. (1912). An Introduction to Metaphysics. G.P. Putnam's Son's, p.48.

> "Consider, [...] movement in space. Along the whole of this movement we can imagine possible stoppages; these are what we call the positions of the moving body, or the points by which it passes. But with these positions, even with an infinite number of them, we shall never make movement. They are not parts of the movement, they are so many snapshots of it; they are, one might say, only supposed stopping-places. The moving body is never really *in* any of the points; the most we can say is that it passes through them."

[45] Schwenk, T. (1996). Sensitive Chaos: The creation of flowing forms in water and air (Second Edition). Rudolf Steiner Press, p.45.

> "The vortex has yet another quality that suggests cosmic connections. If a very small floating object with a fixed pointer is allowed to circle in a vortex, it always points in the direction in which it was originally placed, that is it always remains parallel to itself! In other words, it is always directed to the same point at infinity. It can of course be started off pointing in any direction and it will then remain pointing in this direction

while circling in the vortex. This shows how a vortex is oriented-as though by invisible threads-with respect to the entire firmament of fixed stars."

[46] Grush, R. (2004). The emulation theory of representation: Motor control, imagery and perception. *The Behavioral and Brain Sciences*, 27, p.381.

"To the extent that the process noise is small compared to the sensor noise, the a priori estimate will be more reliable than the observed signal, and so a smaller portion of the residual correction is applied to the a priori estimate. To the extent that the sensor noise is small compared to the process noise, the observed signal is more reliable than the a priori estimate, and so a greater portion of the residual correction is applied."

[47] Todes, S. (2001). Body and World. MIT Press, p.228.

"...[T]he very rationality of our theoretical reason is a representation of a hoped-for-world, better than the one we live in. Reason is not just facilitated by hope; it is itself a way of hoping. We are vulnerable in the perceptual world we find ourselves in. The possibilities of disappearance, dissatisfaction, destruction and disillusion can never be entirely driven away; we can never do more than hold them at bay, for the time being. Our knowledge is that of a precariously balanced judgement, which has to shift with shifting circumstances."

[48] Inzlicht, M., *et al.* (2011). The need to believe: a neuroscience account of religion as a motivated process, *Religion, Brain & Behavior*, 1 (3), p.205.

"So primes of order resulted in reduced states of distress. Importantly, order was all that mattered; whether this order was personally scrutable or not did not affect subsequent states of error-related distress. In other words, our two order conditions capture two kinds of epistemologies, one where order is personally known, and one where it is exclusively known to some external force (or agent). The fact that incomprehensible order also relieved states of distress suggests that what is

important is the existence of a "master-plan," and that personal knowledge of this plan is almost superfluous. This is consistent with research indicating that people seek to increase feelings of control, even if that means it is someone (or something) else that is doing the controlling."

[49] Heidegger, M. (1975). "Building Dwelling Thinking", in Poetry, Language, Thought, Translated by Albert Hofstadter. Harper Collins.

SURFISM

The fluid foundation of consciousness

Surfism is a philosophy that views existence in terms that correspond to surfing.

The perceptual link between surfing and surfboard design provides a way into the mind by showing how spatial perception underpins consciousness.

'Dan writes for us surfers, though his concepts will be understood and debated by existential philosophers.'

Pierce Flynn, Ph.D

'I think the greatest minds are those who can draw the broadest analogies and metaphors between apparently unrelated stuff. In fact, it is pretty amazing that the mind is capable of such things! In this regard, *Surfism* is a veritable *tour de force!*'

Steven Lehar, Ph.D

Parts of this book appeared in the *Indo-Pacific Journal of Phenomenology*, under the title: "Zen and the Art of Surfboard Design".

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