

Emotions Including Anger, Bodily Sensations and The “Living Matrix”

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Abstract: The importance of the body is enormous; it is our physical reality. So maybe it is about time we recognize not only that "there is no human function which does not involve both the brain and social context" [1], but also that there is certainly no human function that does not also involve our bodies and all that this implies. And we may well ask what in fact does this imply? Science in general has been interested in a world "out there". However, largely due to quantum physics, consciousness, awareness, inner experiencing and human perception are now being taken seriously in many fields of study such as transpersonal psychology, anthropology, and neuroscience. Even new disciplines like consciousness studies and electronic biology are being created. Psychology, in its endeavor to be recognized as a science, has largely made an object of its field of interest by looking at the human being in a mechanical way. Psychology too, almost by definition, has concerned itself mainly with certain aspects, namely the mind (usually associated with the brain), neurological processes and behavior and it has therefore neglected the body. The phenomenological method, as an additional way of gaining information through introspection, will also briefly be discussed here. In this essay the effect of our thoughts when naming an emotion such as anger and fear on our bodies will be considered. In addition the "living matrix" model, which owes its origin to quantum mechanics and electronic biology, will be presented as a new complementary way of understanding how the living organism functions. The basic tenets of the quantum reality will also be presented.

Keywords: Anger, body, emotions, living matrix, quantum mechanics, thoughts.

INTRODUCTION

When the subject matter of psychology becomes the whole “human being”, which embraces mind, body and soul, it, as a discipline, can possibly throw more light on what it means to be a human being by also encompassing in its field of study the inner experience of the individual, including that of the researcher. In this way we may cut through all the apparent complexity we see on the outside and also find out how mind, including out thoughts affect and interact with our bodies.

Even though Descartes, in response to his question “what am I?” came to the conclusion he “was an immaterial thinking thing with the faculties of intellect and will” [2] most of us, unless we suffer from some sort of pathology, will admit that we are more than our thinking minds and that we are also feeling beings.

WAYS OF LOOKING AT EMOTIONS

Psychologists have studied emotions in human beings and in animals to find out more about them and the factors involved. Hypotheses have then been generated and later tested through experimental procedures. Going beyond observation and description, psychologists have also

speculated about the systems involved. Sometimes these two approaches overlap. Psychologists also find out more about emotions and the factors involved through questioning subjects about them. On the basis of these approaches, different theories have been put forward which involve and seek to explain the classification, origin, location, experience and function of emotions in general. The same may be said for specific emotions like anger.

Of course, psychologists are not the only ones who have studied emotions. In classical times emotions were studied by natural philosophers. In the East how to work with and transform emotions are in fact part of the subject matter of the spiritual classic known as *The Bagavadgita* [3].

One of the many psychologists who have looked at the phenomena of emotions through observation or from the ‘outside in’ is William James. He considered that the physiological phenomenon or the experience of the bodily response, which directly follows a perception of the event, is what gives rise to the experience of emotion [4]. He then went on to consider the system involved, which he identified as the autonomic nervous system (ANS). Since then different psychologists have increasingly refined their knowledge about emotions, the ANS and the different locations in the brain, which correspond with emotional arousal. Other psychologists have proposed that the cognitive aspect controls the quality and intensity of emotions: for instance, Lazarus [5] has defined them according to their “core

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relational themes". And yet others, like Prinz [6], have combined somatic experiencing with the cognitive aspect, in an approach sometimes known as neo-Jamesian. Griffiths and Scanarantino [7] have taken a broader perspective by introducing the importance of the social and cultural environment in the development and communication of emotion. This is just to name a few for there are many more theories of emotion.

Some psychologists seek to find the factors involved in emotions through the use of self-reports and questionnaires. For example, in studies related to aggression we have the Buss-Perry Aggression Questionnaire [8], and the CAMA (*Cuestionario de Actitudes Morales sobre Agresión*) originally constructed by Lagerspetz & Westman [9] and subsequently revised by Ramirez [10] and by Ramirez & Folgado [11].

Ethologists too have studied emotions in animals and man. Darwin felt that emotions aid survival, claiming that "the young and the old of widely different races, both with man and animals, express the same state of mind by the same movements" [12]. The connection between a state of mind and its organization neurologically is an important aspect of Darwinian thought. Darwin too has influenced the study of emotional responding which centers on facial movement patterns; and modern ethologists have shown how this, together with vocal patterns as signals, help regulate behavior in infancy and early childhood [13].

THE PHENOMENOLOGICAL APPROACH

Hockenbury & Hockenbury [14] in their definition of emotions identify emotions as having three components: "a subjective experience, a physiological response, and a behavioral or expressive response".

So another way of going about studying emotions is from the inside out, i.e. subject experience. This, broadly speaking, is known as the phenomenological approach and it has its roots in the philosophical work of Edmund Husserl [15]. Though there are many styles of phenomenology, according to him, its central aim, is "to listen 'to the things themselves'...in other words, how would the thing studied describe itself if it had the ability to speak?" [16]. It also involves introspection. Strangely, Goethe predated¹ Husserl, but, as Seamon shares,

only in the twentieth century, with the philosophical articulation of *phenomenology*, do we have a conceptual language able to describe Goethe's way of science accurately....In its time, Goethe's way of science was highly unusual because it moved away from a quantitative, materialist approach to things in nature and emphasized, instead, an intimate, firsthand encounter between student and thing studied. Direct experiential contact became the basis for scientific generalization and understanding [16, p. 1].

Curiosity, discovery and often surprise are inherent to the method as nature slowly reveals its secrets through whispers of intuition to the avid and committed observer. In this

method phenomena are certainly described "as clearly as possible" although not as an end in itself, but as a way for the scientist to open himself to the things of nature, to listen to what they say, and to identify their core aspects and qualities. Goethe wanted us "to encounter nature respectfully and to discover how all its parts, including ourselves, belong" [16, p. 8]. Whereas analytical science is concerned mostly with causality, phenomenology is concerned with finality although it can also include the analytical perspective as the investigation of our experiences from a phenomenological point, and it can give rise to interesting new perspectives that are then testable through empiricism².

THE "FELT SENSE" AND SOMATIC EXPERIENCING

Using the phenomenological approach might be an ideal way of finding out more about how we experience emotional states in or through our bodies when we (including our bodies) are faced with different situations in the outside world, or even how our bodies react to our own thoughts. The felt sense is described by Eugene Gendlin [18] in his book *Focusing* in the following way:

A felt sense is not a mental experience, but a physical one... A bodily awareness of a situation or person or event. An internal aura that encompasses everything you feel and know about the given subject at a given time - encompasses it and communicates it to you all at once rather than detail by detail.... A felt sense doesn't come to you in the form of thoughts or words or other separate units but as a ...bodily feeling. [18, pp. 31 -32]

The tracking of the felt sense of the body was developed into a trauma healing therapy by Levine [17] who called it somatic experiencing. Curiously, focusing on inner sensations and describing them but not naming the emotion that they represent, has also been found to be very therapeutic [18].

BODY MAPPING OF EMOTIONS INCLUDING ANGER

Recently there has been some very interesting original research on somatic experiencing through a self report method called "body mapping" which, through the use of computer technology, reveals where people experience different emotions in the body [19]. Applying it, Nummenmaa, Glerean, Hari *et al.*, discovered that "each emotion was topographically different from each other and that these maps showed a concordance across West European and East Asian samples. Emotions adjust our mental and also bodily states to cope with the challenges detected in the environment" [20]. They also mapped anger.

Inner investigation of our somatic experiences from a phenomenological point of view may also play a role in helping us to generate hypothesis that can be tested by science and also to throw more light on how we, or at least our bodies, are actually experiencing and reacting to our environment, both the outer environment and our inner environment which is created by our own thoughts and stories. When I consider anger, I cannot help but feel the

¹The dates of Husserl are 8 April 1859 to 27 April 1938 whereas Goethe was born 28 August 1749 and died 22 March 1832.

²Van der Wal, J., personal communication, June 2014.

emotion of anger is related to the fight and flight response that Cannon [21] identified so many years ago. On inner examination, when I name fight and then the emotion anger, the sensations in my body are very similar for fight and anger with a slight difference in intensity for anger and there is more activation in the head. I am aware of my arms and more particularly of my hands activating; inner “energy” seems to go to my upper body, and also my throat and jaw activate. This is what one would logically expect as in a situation of danger or perceived danger, as all these areas would become “weapons of attack or defense.” When I contemplate the word “aggression” to see if it evokes the same inner sensations as “fight” or “anger” I find that similar areas are activated, but I also discover that the sensations in my throat, jaw and head are more pronounced than in my hands and that my shoulders are also involved.

Based on my own experience I would predict that if we mapped fight, anger and aggression we would discover the topographical distribution of the sensations to be very similar, maybe with the sensations to do with anger being more pronounced than with fight and also more activation in the head. Also with aggression, I would expect there to be a slight qualitative difference from anger in that sensations would probably be more intense in the shoulders, throat, jaw and head.

On the other hand, when considering the fear response, I would predict a very different scenario for I feel that although it is part of a continuum of flight, fear and dissociation, each emotion corresponds with very different body sensations. If the base reaction to a perceived danger were flight, I would expect the felt sense to be primarily in the legs and somewhat all over the body. However if the subject could not act on the impulse to run or was for some reason unable to run, the felt sense would change and the felt sensations would shift to the stomach and the upper part of the body and probably a freezing response accompanied by contraction would be felt with the lack of ability to move. No doubt the person would identify this as fear. If the threat continued and the subject felt there was no way out, I would expect the experiencing person to dissociate from all body sensations. In this case the subject might have some sensations in their head or none at all. These predictions are based on my own inner experiences when naming the different conditions.

When we look now at some of the findings of Nummenmaa *et al.*, [19]³ we must remember that their study was neither directed at addressing these hypotheses directly nor at identifying the subtle differences in somatic experiencing between fight, anger and aggression.

From their results we are unable to ascertain if fight, anger and aggression are topographically different purely because they were not investigated separately. However it will be noticed in Fig. (2) that the topographical activation of the body for anger is certainly what I also expected for fight for the areas most activated occur in the hands, lower face or jaw and upper body. However in anger the head too is activated. This certainly warrants further research for it might reveal a more complete understanding of the full range

of inner sensations to do with anger and related states like fight and aggression.

The fear response does change in the different situations tested by them [19]. In Fig. (3), where basic emotions have been triggered through guided narratives, we see that the experiencing subjects have included activation of the legs. It is quite probable that the guided imagery enabled the subjects to resonate with the flight response rather than the fear response as the topographical area activated is certainly consistent with the activation of areas needed for running away. Fear, however, being a qualifiedly different state to flight, is topographically experienced in the upper body, as can be seen in Figs. (2 and 4) much the same as I predicted. Interestingly in Task 1 there is more activation in the belly than in Task 3. There is no recorded state by Nummenmaa *et al.*, [19] that corresponds with dissociation. It is also interesting that the neutral subject in Fig. (2) has the “head” region activated; we could expect this, as the exercise is to do with listening to narratives, which is a “mental activity”.

This study raises many interesting questions about anger and fear and their related states even though it was not directed at understanding them in greater depth.

WHICH ENVIRONMENT?

In summing up, Nummenmaa *et al.*, [19] claim that emotions “adjust our mental and also bodily states to cope with the challenges detected in the environment”. It is here that we must clarify further by asking which environment. There is the environment outside of our bodies and also the environment created by our thoughts inside. In some eastern philosophies the mind is seen as the “sense behind the senses⁴” that takes in information and responds in creating internal sensations and as such the sensations we are receiving through our bodies need not come only from the world outside but from our inner world of the mind. In their experiment they used three different experimental conditions: emotional words, stories or movies and facial expressions where the subject has to identify the inner body sensations of people expressing different facial expressions.

Task 1 concerns basic emotions associated with words. In Fig. (2). the inner environment is clearly activated when they name each emotion and examines how it is experienced in the body.

Task 2 concerning stories or movies can be either for it depends on whether the subject is thinking about the story or actually sees her/himself as part of the story. The latter seems likely in the fear response the topographical area activated was distinct from task 1. In this condition the area activated included the legs and was therefore more consistent with fleeing or “running away”. It could also be related to the flight response. On the other hand, being a story, the topographical area activated also included the head area. The difference between the neutral figures in condition 1 and 2, also indicates that condition 2, Fig. (3) was perceived as a task, which activates the head area.

Task 3 that required that the subject identified the sensations experienced by another person from their facial

³See supporting information (SI)

⁴Arka, S. personal communication, Sept. 2014

expression, reveals similar results to Task 1 and once again the head area is activated for both anger and fear. What is interesting, the neutral figure also shows more cool areas in the body than in Task 1 & Task 2. The reason behind the results in Task 3 seems as though it might involve a different system or at least a different receptor route to either Task 1 or Task 2.

THE LIVING MATRIX

The living matrix is a term coined by Oschman and Oschman [22]. It refers to an interconnected molecular network that enables high-speed communication between all of the body systems. “The living matrix influences every physiological process in the body. It is a material and energetic substrate for communications that integrate and coordinate all actions” [23, p.23]. J. L. Oschman was influenced by the work of nobel laureate Szent-Györgyi who, on observing his cat’s reaction to a snake, came to the conclusion that this instantaneous “levitation” or “bong” of the cat was much quicker than any system that had yet been explained in scientific terms. He discounted nerve impulses and chemical reactions as both being too slow to explain “life” and instead proposed a system of molecular electronics and conduction in collagen, which has now given rise to a field called “electronic biology”. “Life is too rapid and subtle to be explained by slow-moving chemical reactions and nerve impulses. Something else is going on” [24, p.194]. Szent-Györgyi therefore felt it had to be a sub-molecular system rather than something mechanical. In this world “the actors can be none other than small and highly mobile units such as electrons and protons” [23, p. 20]. This has given rise to the idea that the basic design of the body is both mechanical and energetic. Oschman also believes that “the matrix is the system that connects our thoughts, our words, and the events around us, right down to the nucleus and the genetic material” [23, p. 23].

To summarize, the ultra rapid response of Szent-Györgyi’s cat is now seen as a reaction of a continuous holistic system which is made up of a matrix inside a matrix inside a matrix where “the cell has a nucleus, which is a matrix, which is inside of a larger matrix - the cytoskeleton - which is inside of a larger matrix, which we call the connective tissue” [23, p. 23]. This also extends outside of the body as the “biofield and other electric emanations” [23, p.23]. Numerous research papers involving “biophotonic” phenomenon in bacteria, plants, animals and humans also support this [25].

RECEPTOR CELLS

Oschman [23] suggests that some of the signals coming into the organism are below threshold in the sense “they are not strong enough to generate a neural impulse”. However from the point of view of a biologist, he feels that even though “sub threshold events do not get conveyed to the brain ... living systems are characterized by their great efficiency.... Perhaps the sub-liminal or sub-threshold information is important. Perhaps under some conditions that information would save your life” [23, p.27]. These contemplations led him to suggest that the “sub-threshold information goes into the matrix. Our senses split

information into two pathways, the living matrix and the neuromatrix” [23, p. 27]. Maybe the splitting of information into the living matrix pathway and the neurological pathway by receptor cells of the different sense organs is what allows neurological perception to remain manageable [23, p. 26]. According to him, the living matrix subconscious pathway gives rise to “authentic action” and the neural pathway to “thoughtful action”, as can be seen in the Fig. (1) below:

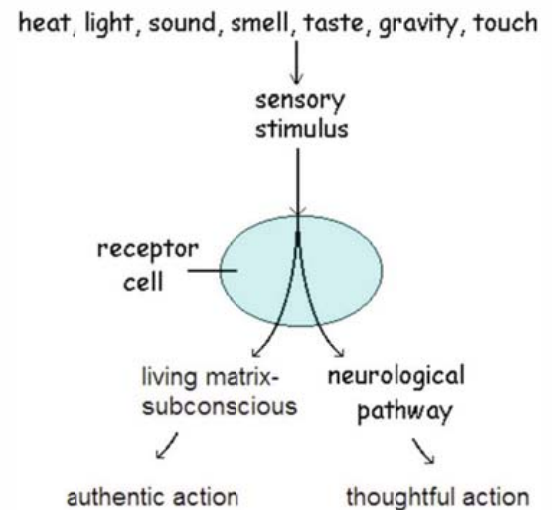


Fig. (1). “Receptor cells which perhaps split sensory information into two pathways, giving rise to two kinds of consciousness and two kinds of action” [23 p.27]. Reproduced by courtesy of Oschman, J.L.

Oschman [23] hypothesizes further that “the sub threshold input into the matrix gives rise to what has traditionally been called the sub-conscious” [23, p. 27]. And building on this hypothesis, “the sensory inputs to the subconscious may operate right down to zero intensity, to the quantum level” [23, p. 28].

On the other hand, Ramirez⁵ has for many years been using the term *extra sensory perception* to refer to information that bypasses our normal sense receptors and that is not deducible to prior experience. The yogi and philosopher Srinivas Arka also refers to our mystical senses which access information and give rise to what is known as intuitive knowledge [26]. Whether the receptor cells work in the way Oschman suggests above has still to be demonstrated. His theory seems to be talking about how information comes into the system whereas Ramirez and Arka seem to be talking about how we can access information. However all of them seem to concur that that the human being can access information, which does not arrive in the normal way through the senses and the neurological pathway for Oschman also says “we do not know the limits of sensory awareness. Certainly you know a lot more than you think you know” [23, p.28]. This suggests

⁵Ramirez 2014, personal communication

that our subconscious is where vast amounts of information from our environment including of course other people are stored. This is consistent too with Arka's (26) theory of different levels of consciousness.

THE LIVING MATRIX AND EMOTIONS

An interesting proposition is that we probably have two ways of knowing, one that comes from the conscious mind and another that is extra sensorial coming from the matrix. How we access the information in the subconscious still has to be answered. Subliminally it seems we are receiving information all the time from the environment, including other people, our own minds, and probably also the minds of others.

If we respond to own thoughts when we just name an emotion, it is highly likely that our sensitive system is picking up the feelings, emotions and even intentions of others as well. Certainly our bodies, like that of Szent-Györgyi's cat, will also pick up signals that have to do with our survival almost instantaneously.

This brings us to the fight flight response. Fight is considered by psychologists to be different from anger, even though it appears here that it may involve the same topographical area in the body. Could it be that anger is a response to our own thoughts and stories? The fight response on the other hand might be elicited by something dangerous or perceived to be dangerous on the environment outside. This response when activated by outside, probably also involves physiological changes and behaviors and even mixed emotions rather than a single emotion.

Here again one needs to caution, for what is dangerous and what is perceived to be dangerous may also be a projection of our own thoughts and stories. When we start thinking of thoughts and emotions as energy that affect our own living matrix and that this living matrix is part of a much larger living matrix, which is in turn part of a much larger living matrix, we begin to understand the interconnected nature of the Universe.

SOME IMPLICATIONS OF THE THEORY OF THE "LIVING MATRIX"

This living matrix model will probably in time revolutionize how psychologists view emotions. In principle, it is complementary to the neuromatrix model of how the living organism works. From research into the embryo we know that aspects of body including the cells that will later become mesoderm actually develop even before there is a body, as we know it. Even the system related to the heart and the actual heart as an organ develops before the brain [27]. In this sense the meso layer or connective tissue layer, can be seen as part of our primary system along with the heart system. Therefore the neural system may not be as primary as it has usually been assumed⁶. In this context, the neuro system, which only develops later, is therefore secondary⁶.

⁶Lindhard, T. (2014) *Learning to "See" the Dynamic Nature of the Embryo*. Unpublished paper.

Body sensations that have to do with emotions can be activated in different ways. The first being a stimulus directly from the environment like in the case of Szent-Györgyi's cat when it saw the snake. As we have seen, this event gave rise to the living matrix theory of how the living organism works. When a stimulus comes from the environment outside and has to do with danger, it would activate the flight fight response, and this is probably a living matrix response for it needs to be very quick. In Oschman's terminology, it could be seen as an "authentic action".

Man, who has developed a thinking mind, also activates his inner environment through his thoughts in the form of body sensations. Arka claims:

Though thoughts are invisible, they are as effective as visible matter. They have their own shape, size color and carry a certain quantum of energy. Regardless of their nature, thoughts will affect the source first before they reach the atmosphere. [28, p. 23]

This seems to be supported by the findings of Nummenmaa and colleagues [19], which suggest that each emotion affects our body in a specific topographical way depending on the emotional word pronounced. Whether this activation is through the neural matrix or the living matrix is still not clear but as it is very quick and also as it seems words have an energetic component, it suggests that it might be through the living matrix. In their [19] study where just thinking of an emotional word like anger activated a certain topographical area in the body, one can only imagine what would happen to one's system if the person were really angry. This seems to imply that men might be prisoners of their own minds and their inner stories. If their stories are pleasant no doubt their inner experiences will be pleasant but if they are unpleasant then the person's body sensations no doubt will also be experienced as unpleasant. This is what eastern philosophy claims and part of the spiritual path in the East is to overcome our habitual ways of thinking [3]. Often people do not recognize that they are producing their own inner environment through their stories and then rather than work on themselves they project that emotion onto somebody outside. Emotional Intelligence is an approach, which has arisen to help manage our emotions, as is Gendlin's method of focusing. Whereas certain meditation methods, like the Arka Dhyana method, also known as intuitive meditation (IM) teaches how to go below the rational mind to connect with the subliminal mind and the "touchless spirit" or Self [26].

THE QUANTUM REALITY

Behind, beneath or beyond Newton's material universe, the quantum reality reveals a very different picture. McFarlane [29] sums the differences up in the following ways: 1) that atomic matter, supposedly the ultimate immutable substance, dissolves into waves of potential existence. 2) That determinism, which rigidly governed Newton's universe like a cosmic machine, falls apart, giving us a world with spontaneity. 3) That the objective world, existing "out there" independent of observers, vanishes, leaving a world in which the observed phenomena depend

upon how we choose to observe them. And 4) that the manifold world of separate independent objects interacting locally within space and time is transcended, revealing a realm where all things are non locally united in an indivisible whole.

The living matrix model of reality is a sub-molecular system where everything is interconnected. Our thoughts and words, especially those with an emotional charge, contain a certain quantum of energy that is picked up through our bodies. Observers too are part of the quantum or living matrix reality and everything they think and do affects themselves and also the matrix. Objectivity and strict determinism fall away giving rise to a world that is full of waves potential and spontaneity. In the light of this, it seems that intuition, extra sensory perception and awareness of our bodily sensations are necessary requirements for learning how to operate consciously within the matrix.

As strange as it might seem, this world is not some “far distant land” but it is hidden beneath the “veil of materialism”. Furthermore to get to the quantum realm we do not need any special equipment; it is here, we live in it [29].

CONCLUSIONS

Today’s society puts so much stress on developing the rational thinking mind. Through receiving such a one-sided education, not only is modern man often cut off from his or her own body experiences, but also lacks the information that is received through the feeling body to adjust appropriately to outside situations. Most people too do not recognize how their own thoughts and stories are activating their inner environment. This opens up many areas of investigation as well as points to ways how people can improve their own inner sensations by changing the conditioning of their minds and the habitual way of thinking and seeing the world [30].

Quantum mechanics is giving rise to new understandings of how systems operate. The living matrix is one such model. It certainly helps explain how within and even outside of the body we live in a holographic universe with each part affecting each and every other part; a matrix within a matrix within a matrix. The living matrix model also gives our body a central place, not only because the body forms an active part of this theory, but because awareness of our bodily sensations point to how we can find our way home and go beyond our thinking minds and our own stories.

Introspection seems to be a way we can acquire more information about how we can work from the inside out. Body mapping too appears to be a novel way we can test how our thoughts of an emotion or our stories affect our bodies or inner environment. This methodology could certainly also be extended to see how people perceived danger on the outside. Maybe our emotions including anger only exist when we name our inner sensations and this starts a feed back loop that involves our feelings⁷, the neural matrix and the living matrix.

⁷The term “sensation” is used to mean the perception and experience of stimuli, and the term “feeling” to refer to “the experience in the body of a

Animals in the wild hunt and kill, but this is not the same as killing out of anger. Are our wars based on the stories we tell ourselves about the others and these stories simultaneously activate our bodily matrix in a certain way? This certainly seems to be supported by the Seville Statement on Violence which ends “Just as ‘wars begin in the minds of men’, peace also begins in our minds. The same species that invented war is capable of inventing peace. The responsibility lies with each of us” [32].

Although quantum physics has been around a long time, the implications of this theory and how it works has not yet been fully comprehended by other scientific disciplines. It is suggested here that psychologists can easily extend the living matrix model of reality, which is based on quantum mechanics, to understand aspects of human functioning like emotions and how our thoughts as quantum of energy affect our inner environment and probably also our outer environment. There is much to investigate but one thing seems certain, according to the living matrix model of reality, our bodies may be much more important than many of us may have previously realized.

SUPPORTING INFORMATION

Recent novel research on somatic experiencing through a self-report method called “body mapping” reveals where people experience different emotions in the body [19, 20]. Although t Nummenmaa *et al.*, were interested in emotions in general, we have extracted anger, fear and neutral from their results to see what we can observe and learn from them.

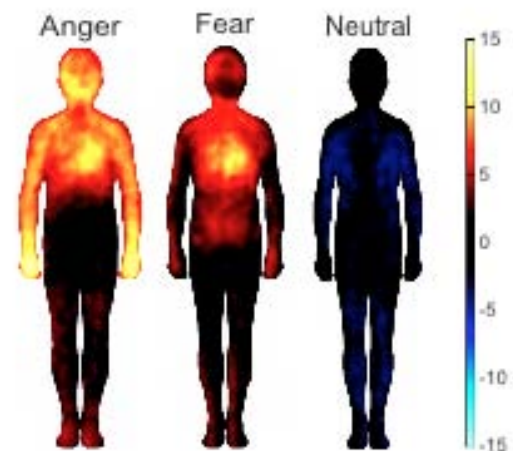


Fig. (2). Task 1: “Body topography of basic emotions associated with words. The body maps show regions who activation increased (warm colors) or decreased (cool colors) when feeling each emotion. ($p < 0.05$ FDR corrected; $t > 1.94$). The colorbar indicates the t-statistic range” [19 p. 647]. Copyright 2013, National Academy of Sciences, USA.

configuration of sensations. Emotions are experiences that link feelings in the body with thoughts” [31, p. 85].

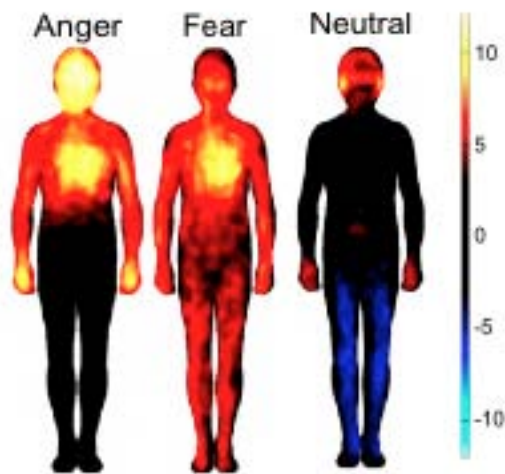


Fig. (3). Task 2: “Body topography of basic emotions triggered by emotional imagery guided by narratives. The body maps show regions whose activation increased (warm colors) or decreased (cool colors) when feeling each emotion. ($p < 0.05$ FDR corrected; $t > 2.11$). The colorbar indicates the t-statistic range”. Copyright 2013, National Academy of Sciences, USA.

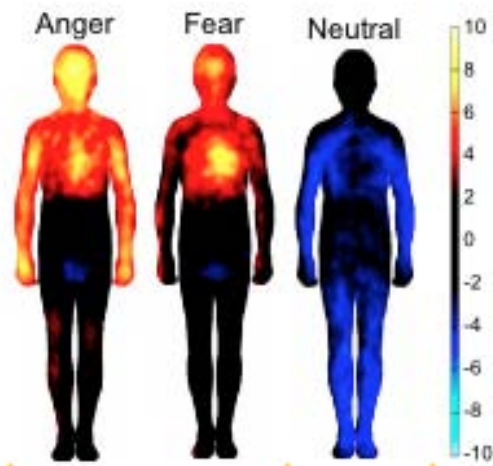


Fig. (4). Task 3: “Body topography of basic emotions while observing the emotional expressions of others. The body maps show regions whose activation participant evaluated as increased (warm colors) or decreased (cool colors) in the person displaying each facial expression. ($p < 0.05$ FDR corrected; $t > 2.09$). The colorbar indicates the t-statistic range” [19 SI p. 2]. Copyright 2013, National Academy of Sciences, USA.

CONFLICT OF INTEREST

The author confirms that this article content has no conflict of interest.

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Declared none.

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