

ORIGINAL ARTICLE

Intuitive Intelligence, Self-regulation, and Lifting Consciousness

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ABSTRACT

This article explores the role of the heart in emotional experience, as well as how learning to shift the rhythms of the heart into a more coherent state makes it possible to establish a new inner baseline reference that allows access to our heart's intuitive capacities and deeper wisdom. The nature and types of intuition and the connection between intuition and compassionate action are discussed. It is suggested that increased effectiveness in self-regulatory capacity and the resultant reorganization of memories sustained in the neural architecture facilitates a stable and integrated experience of self in relationship to others and to the environment, otherwise known as consciousness. The implications of meeting the increasingly complex demands of life with greater love, compassion, and kindness, thereby lifting consciousness, are considered.

INTRODUCTION

Life is composed of a series of circumstances and situations about which individuals must make decisions and take action. More and more, as social and other challenges increase, there is a call for lifting up individual and global consciousness, in the sense of choices made, such that daily life may become more tenable and the future of our planet may become more assured.¹ In a world that is moving more and more quickly and is increasingly complex, it is desirable to have access to the most effective and expedient strategies for adapting and making good decisions. Much attention has been given to identifying the many factors that go into making intelligent decisions, including awareness of self and others, cognitive flexibility, and emotional self-regulation. A newer avenue of scientific exploration relates to uncovering the nature and functioning of intuition, or what is also referred to as intuitive intelligence. In a meta-analysis of the literature on intuition, Hodgkinson et al state that while there have been many conceptualizations of the nature of intuition, there is a growing body of research that suggests underlying non-conscious elements, such as implicit learning and knowledge and pattern recognition, which are involved in intuitive perception.² Research also suggests that intuition may play an important role in social cognition, decision-making, and creativity. In the absence of access to innovative problem-solving approaches, people are likely to default to familiar patterns of thought, feeling, and action to address situations that could often be more effectively managed with new, creative solutions that take into consideration the available inner resources that are congruent with one's deeper core values. Lifting up individual and global consciousness, in the largest sense, is fundamental to positively impacting individual and collective health and well-being and harmony. We suggest

that this relies heavily on individuals taking self-responsibility for establishing a new baseline reference and alignment with their intuition that provides moment-to-moment guidance, which we call heart-based living.

The ability to alter one's responses and behaviors in order to build and maintain loving relationships and a supportive social network, as well as to effectively meet the demands of life with composure, consistency, and integrity, arguably becomes central to good health, effective decision-making,³ and success in lifting consciousness and living a life of greater collaboration, kindness, and compassion. If one's capacity for intelligent, self-directed regulation is powerful enough, then regardless of inclinations, past experiences, or personality traits, people can usually do the adaptive or right thing in most situations they encounter.⁴ It has been shown that the practice of making efforts to self-regulate can produce broad improvements in self-regulatory capacity similar to strengthening a muscle, making people less vulnerable to depletion of internal reserves.⁴ When internal reserves are depleted, normal inner restraints are weakened and intelligent decision-making can become compromised through inappropriate behavior, lost opportunities, stress, and damaged relationships. Despite the importance of self-directed control to optimal function, self-regulatory capacity for many people is often far less than many would consider ideal. In fact, failures of self-regulation, especially of emotions and attitudes, are central to the vast majority of personal and social problems that plague modern societies. Therefore, the most important strength that the majority of people in society need to build is the capacity to self-regulate their emotions, attitudes, and behaviors. It is this capacity that allows people to mature and meet the challenges and stresses of everyday life with resilience and make more intelligent decisions by aligning with

their own innate higher order wisdom and expression of care and compassion, which we often think of as elements of living a more conscious life.

Effectively dealing with stress and sustaining one's resilience primarily involves learning to recognize and self-regulate the stream of ongoing thoughts and especially emotional undercurrents (judgment, negative projection, insecurity, worry, etc) that create incoherence and waste energy. By learning to increasingly replace these feelings with more positive, regenerative attitudes and perceptions, we can establish a new inner baseline reference, a type of implicit memory that organizes perception, feelings, and behavior⁵ and allows for more effective responses that use the heart's perceptual abilities to access and bring forth a deeper innate source of wisdom. Without establishing a new baseline reference of self-regulation that incorporates intuitive perspectives, people are at risk of living their lives through the automatic filters of past familiar experience.

The root of the term *intuition* stem from the Latin word *in-tuir*, which can be translated as "looking, regarding, or knowing from within." In a review article, Gerard Hodgkinson concludes that intuiting is a complex set of interrelated cognitive, affective, and somatic processes, in which there is no apparent intrusion of deliberate, rational thought. He also concludes that the considerable body of theory and research that has emerged over recent years clearly demonstrates that the construct of intuition has emerged as a legitimate subject of scientific inquiry that has important ramifications for education, personal, medical, and organizational decision-making, personnel selection and assessment, team dynamics, training, and organizational development.² Another comprehensive review of the intuition literature defined intuition as "affectively-charged judgments that arise through rapid, non-conscious, and holistic associations."⁶ Damasio also suggests that the outcomes of intuition can be experienced as a holistic "hunch" or "gut feel," a sense of calling or overpowering certainty, and an awareness of a knowledge that is on the threshold of conscious perception^{7,8}

Several authors have contended that intuition is an innate ability that all humans possess in one form or another and is arguably the most universal natural ability we possess. They also suggest that the capability to intuit could be regarded as an inherited unlearned gift.^{9,10} A common element also found in most discussions and definitions of intuition is that of affect or emotions. Intuitions are felt, although they can be accompanied by cognitive content and perception of information. In this article, we suggest that emotions are the language of intuition and that intuition offers a largely untapped resource to manage and uplift our emotions and consciousness.

As pervasive and vital as they are in human growth and experience, emotions, and effective ways to self-regulate them, have long remained an enigma to science. Many common emotion regulation strategies operate on the assumption that all emotions fol-

low thought and thus, by changing one's thoughts, one should be able to gain control over one's emotions. However, in the last decade, research in neuroscience has made it quite clear that intuition and emotional processes operate at a much higher speed than cognitive processes.¹¹ In many cases, emotions occur independently of the cognitive system and can significantly bias or color the cognitive process and its output or decision.^{12,13}

The quest to understand the complex interaction between different parts of the brain and how it relates to cognition and the felt experience of emotion has been addressed from many perspectives. This article explores recent scientific understandings that help clarify the role of the heart in emotional experience and effective approaches to self-regulation that involve shifting the rhythms of the heart, thereby allowing us to facilitate cognitive functioning and intuitive capacities.

The question of how intuition, as an aspect of automatic functioning, is related to deliberate, conscious thought processes has long been the subject of debate. Research in the fields of cognitive and social psychology has resulted in the fairly well accepted dual-process theory, which posits that there is an intricate interaction between automatic unconscious processes and slower, conscious processes.¹⁴ While it has been defined in a variety of ways, there is a good bit of consensus that at a basic level, the conscious state, or individual consciousness, can be understood as the awareness of one's self and of one's environment and the corresponding capacity for self-directed action which is informed by input provided through implicit and automatic processes.¹⁵ Emerging lines of scientific thought suggest that the consistent sense of self is maintained as patterns of activity in the intricate internal communication and interactions within nested hierarchies of neural networks and processes.¹⁶ A brief overview of the nature of these patterns, which in essence sustain implicit memories and provide a stable reference for experience, therefore becomes pertinent as they underlie a variety of processes that are central to optimal function, intuition, and higher-functioning consciousness.

TYPES OF INTUITION

Intuitive perception is commonly acknowledged to play an important role in business decisions and entrepreneurship, learning, creativity, medical diagnosis, healing, spiritual growth, and overall well-being.^{17,18}

For the purposes of this article, we will use the framework generated by our research at the Institute of HeartMath, Boulder Creek, California, which suggests that there are three different categories or types of processes that the term *intuition* is often used to describe. The first type is often referred to as implicit knowledge or learning, which in essence, refers to knowledge we acquired in the past and either forgot or did not realize we learned. Drawing on the neuroscience conception

of the human brain as a highly efficient and effective pattern-matching device,¹⁹ a number of so-called “pattern-recognition” models have been developed to show how this fast type of “intuitive” decision and action can be understood purely in terms of neural processes in which the brain matches the patterns of new problems or challenges with stored templates in memory based on prior experience.^{2,20,21}

The second type is what we call energetic sensitivity, which refers to the ability of our nervous system to detect and respond to environmental signals such as electromagnetic fields. For example, it is well established that in both humans and animals, nervous system activity is affected by geomagnetic activity.²² Some people appear to have the capacity to feel or sense that an earthquake is about to occur before it happens. It has recently been shown that changes in the earth’s magnetic field can be detected about an hour or even longer before a large earthquake occurs.²³ Another example of energetic sensitivity is the sense that someone is staring at us. Several scientific studies have verified this type of sensitivity.²⁴

The third type, which is the subject of several articles in this issue, is nonlocal intuition, which refers to the knowledge or sense of something that cannot be explained by past or forgotten knowledge or environmental signals. Examples of nonlocal intuition are when a mother senses something happening to her child, who is many miles away, or the repeated, successful sensing experienced by entrepreneurs about factors related to making effective business decisions.

The study of nonlocal intuition, which at times has been thought of as interchangeable with processes categorized as psi phenomena such as telepathy, clairvoyance, and precognition, has been fraught with debate in the scientific community.²⁵ While there are various theories that attempt to explain how the process of intuition functions, such as the pattern-recognition models cited above and the quantum-holographic model by Bradley,²⁶ which postulates that nonlocal communication rests on a resonance between the body’s psychophysiological systems and the quantum-holographic fields, these theories have yet to be confirmed, and an integrated theory remains to be formulated. Nevertheless, there is increasing research evidence based on an examination of physiological responses that suggests that nonlocal intuition is a real and measurable phenomenon.

A meta-analysis conducted by Bem of nine experiments in the area of “*precognition* (conscious cognitive awareness) and *premonition* (affective apprehension) of a future event that could not otherwise be anticipated through any known inferential process,” revealed statistically significant results in eight of the nine studies with respect to pre-stimulus responses in more than 1000 subjects, indicating a possible retroactive influence of the stimulus.²⁵ Mossbridge likewise concluded by means of a meta-analysis of 26 studies

that a clear anticipatory physiological activity effect of what appear to be unpredictable stimuli is indicated, despite the fact there is no known explanation available for this finding.²⁷

A study that independently replicated and extended previous research documenting pre-stimulus responses found evidence to suggest that the heart is involved in the processing and decoding of intuitive information.^{28,29} The researchers further found evidence that the magnitude of pre-stimulus response to the future event is related to the degree of emotionality of that event.²⁸

IMPLICIT PROCESSES

To gain a deeper understanding of the role of the heart in accessing intuitive intelligence and lifting consciousness, it is first prudent to discuss how memories of past events play a crucial role in setting the stage for implicit types of intuition and emotional perception as well as the important role the heart plays in all three types of intuition.

Recent years have seen the emergence of a new understanding of how the brain functions and how the heart and brain interact in a dynamic and complex relationship.^{12,30} Rather than assembling thoughts and feelings from bits of data like a digital computer, the brain is more like an analog processor that relates whole concepts or patterns to one another and looks for similarities, differences, and relationships between them.³¹

Although dual-process theories come in a number of forms, they all have in common the distinction of two separate processing systems. The first system is contextually dependent, associative, heuristic, tacit, intuitive, and implicit/automatic in nature. Therefore, it is relatively undemanding in terms of its use of cognitive resources. For example, when individuals have gained experience in a particular field, implicit intuitions are derived from their capacity to recognize important environmental cues and rapidly and unconsciously match those cues to commonly occurring patterns that lead to effective diagnosis and problem solving. In contrast, the second processing system is contextually independent, rule-based, analytic, and explicit in nature. It is relatively slow and places greater demands on cognitive resources than does the first system.²

The term *intuition* is also commonly used to describe experiences referred to as insight in scientific literature. When we have a problem we cannot immediately solve, the brain can be working on it subconsciously. A common experience is that when we are showering, driving, or doing something else without thinking about the problem, a solution can pop into the conscious mind, which we experience as an intuitive insight. This type of implicit process involves a long gestation period following an impasse in problem solving prior to a sudden insightful realization or strategy that leads to a solution.³² In contrast, intuition in the first process described above occurs almost instantaneously and is emotionally charged.³³

IMPLICIT PROCESS AND EMOTIONAL EXPERIENCE

Past experience builds within us a set of familiar patterns or memories that are established and maintained in nested feedback loops in the neural architecture. Our experience in navigating life and the associated inputs to the brain from both the external and internal environments contribute to establishing and maintaining these familiar patterns. Many processes within the body provide constant rhythmic inputs with which the brain eventually becomes habituated and familiar. In other words, we establish sets of physiological and behavioral set points or default patterns that, once established, the brain and nervous system strive to maintain.³⁰ Although more complex, this is analogous to setting the temperature to a specific setting on a thermostat that the heating system then maintains.

The internal processes that contribute to the establishment of these stable patterns or set points include patterns of activity in afferent (ascending) neural input from the heart, digestive, respiratory, and hormonal systems, as well as patterns of muscular tension, particularly facial expressions. These inputs are monitored continuously by the brain and help organize perception, feelings and behavior. Once a stable pattern is formed and stabilized in memory, all sensory input to the brain, from both the internal and external sensory systems, is compared to these stable reference patterns. When the current inputs match the baseline pattern, the brain recognizes them as familiar and we experience this as comfortable. It is important to understand that this is true even if the established reference pattern is one associated with chaos, incoherence, confusion, anxiety, etc.

In order to maintain continued stability and feelings of comfort, we must be able to maintain a match between our current experience or “reality” and one of our neural “programs” that has been previously established.³⁴ When we encounter a new experience or challenge, there can be a mismatch between the input patterns and the reference patterns. Depending upon the degree of mismatch, it typically requires either an internal adjustment or an outward behavioral action to reestablish stability. When a mismatch is presented to the brain from either the external or internal sensory systems, a change in activity in the central and autonomic nervous systems is produced. If the response is short-lived (1-3 sec), it is called arousal or an orienting reflex. If, however, the stimulus or event is recurrent, the brain adapts and we habituate by updating the memories that serve as the reference. For example, people who live in a noisy city adapt to the ambient noise and eventually become unaware of it. Subsequent to this adaptation, when they take a trip to the quiet countryside, the lack of noise seems strange and is quite noticeable. The mismatch between the familiar noisy background input and quiet setting leads to an arousal reaction and gets our attention. It is this departure from the familiar that gives rise to a

signaling function, which creates the experience of emotion that alerts us to the current state of the mismatch. It is interesting to note that in this context, the word “emotion” derives from the Latin *emovere*, which means “to move out or away from.”

In addition to processes that monitor the inputs and controls for maintaining stability in the here-and-now, there are also matching processes that appraise the degree of consistency or inconsistency between past events or situations and current ones, as well as between the current situation and the projected future. These appraisals of the future outcomes can be broadly divided into optimistic and pessimistic.³⁵ If the appraisal does not result in a projected ability to successfully deal with the situation and return to stability, feelings of fear and anxiety can result. This appraisal could be due to past negative experience in similar situations or a lack of experience or lack of insight on how to effectively deal with the projected future situation. As we successfully navigate new situations and challenges, we can apply that experience to similar new situations without fear. In essence, we mature through this process as we learn to more effectively self-regulate our emotions and deal with new situations.

Although inputs originating from many different bodily organs and systems are involved in the processes that ultimately determine our internal set points and influence emotional experience, it is now abundantly clear that the heart plays a particularly important role.⁵ The heart is the most consistent source of dynamic rhythmic patterns in the body. Furthermore, the afferent networks connecting the heart and cardiovascular system with the brain are far more extensive than are the afferent systems associated with other major organs.³⁶ In fact, the heart sends more neural traffic to the brain than the brain sends to the heart. The multiple inputs from the heart and cardiovascular system to the brain are major contributors in establishing the dynamics of the baseline patterns or set point against which the “now” is compared. Once established, these internal set points are updated or adjusted according to ongoing experiences, successes, and failures in meeting life’s demands and challenges. Since our psychophysiological systems are designed to maintain stability and resist change, returning to familiar set points gives us a feeling of security, while remaining in unfamiliar territory causes unrest, anxiety, fear, etc. This is true even if the established reference is one of chaos, incoherence, or confusion. This means we can easily get “stuck” in familiar unhealthy emotional and behavioral patterns and that lasting improvements in emotional experience or behaviors cannot be sustained in the absence of establishing a new baseline reference, which the system then strives to maintain. If behavior change or improved affective states are desired, it is therefore critical to focus on strategies that facilitate the establishment of a new internal reference.

SELF-REGULATION AND STABILITY

When the current input to the brain does not match an existing program, adjustments must be made in order to maintain control and stability. One way to reestablish control is by taking an outward action. For example, we are motivated to eat if we feel hungry and take action to find a source of food, we run away or fight if threatened, or we do something to draw attention to ourselves if we are feeling ignored. Alternatively, we can reestablish stability and gain control by self-regulating and making internal adjustments (without any overt action). Pribram and many others conducted numerous experiments providing evidence that the higher brain centers that monitor and label the pattern-matching process can self-regulate by inhibiting or “gating” the information flowing into the brain. For example, where we focus our attention has a powerful effect on modulating inputs and thus on determining what gets processed at higher levels. In a noisy room filled with many conversations for instance, we have the ability to tune out the noise and focus on a single conversation of interest. In a like manner, we can modulate pain from a stubbed toe or headache or desensitize ourselves to sensations like tickling and self-direct our emotions.¹⁹ Ultimately, when we achieve stability through our efforts, the results are feelings of satisfaction and gratification. By contrast, when there is a failure to effectively self-regulate, feelings such as frustration, anxiety, panic, annoyance, apprehension, hopelessness, or depression result.

Unsettled emotions and untypical reactions can be experienced if the neural systems that maintain the baseline reference patterns are in an unstable state. These neural systems can be destabilized from stress, anxiety, chemical stimulants, etc. Therefore, it is clear that optimal function in responding effectively to ongoing inner and outer demands and circumstances depends to a great extent on synchronization and stability of physiological systems.^{5:37}

There is substantial evidence that the heart plays a unique role in synchronizing the activity across multiple systems and levels of organization. As the most powerful and consistent generator of rhythmic information patterns in the body, the heart is in continuous communication with the brain and body through multiple pathways: neurologically (through the autonomic nervous system), biochemically (through hormones), biophysically (through pressure and sound waves), and energetically (through electromagnetic field interactions). The heart is uniquely well positioned to act as the “global coordinator” in the body’s symphony of functions to bind and synchronize the system as a whole.^{5:37,38} Because of the extensiveness of the heart’s influence on physiological, cognitive, and emotional systems, the heart provides a central point from which the dynamics of the psychophysiological systems can be self-regulated.

One of the research focuses of our laboratory over the last decade has been the study of the patterns and

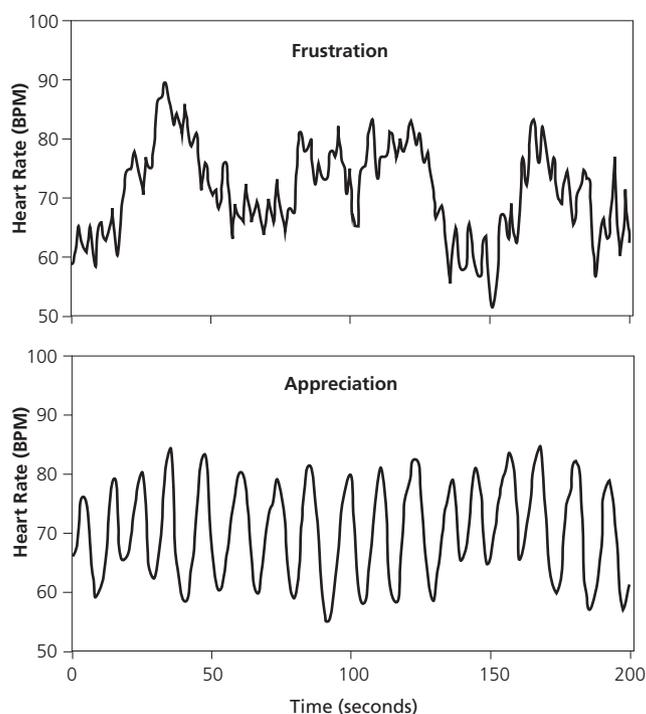


Figure 1 Emotions are reflected in heart rhythm patterns. The heart rhythm patterns shown in the top graph, characterized by its erratic, irregular pattern (incoherence), is typical of negative emotions such as anger or frustration. The bottom graph shows an example of the coherent heart rhythm pattern that is typically observed when an individual is experiencing sustained, modulated positive emotions—in this case, appreciation. Both recordings are from the same individual only a couple of minutes apart. The amount of variability and mean heart rate are the same in both examples, illustrating how the pattern of activity contains information in the absence of changes in physiological activation.

rhythms generated in various physiological systems during the experience of different thoughts and emotions and behaviors. Through experimenting with numerous physiological measures, we have found that heart rate variability (HRV, or heart rhythm) patterns are consistently dynamic and reflective of changes in one’s emotional state (Figure 1).^{5:39}

It is important to note that although changes in heart rate often co-vary with emotions, our research has found that it is the pattern of the heart’s rhythm that is primarily reflective of the emotional state, especially in the case of emotions that do not lead to large autonomic nervous system (ANS) activations or withdrawals.^{5:39,40} Enrique Leon has expanded on our observations by using a neural network approach to analyzing the rhythmic patterns that occur in HRV and has demonstrated 75% accuracy in being able to correctly identify discrete emotional states (ie, anxiety vs frustration, etc) from only the pattern of the HRV.⁴¹ These changes in rhythmic patterns can be independent of heart rate; that is, one can have a coherent or incoherent pattern at higher or lower heart rates. Thus, it is the pattern of the rhythm (the ordering of changes in rate over time) rather than the rate (at any point in time) that is most directly related to emotional dynamics and physiological synchronization.⁵

Physiological coherence, also referred to as heart coherence, cardiac coherence, or resonance, is a functional mode measured by HRV analysis wherein a person's heart rhythm pattern becomes more ordered and sine-wave like at a frequency of around 0.1 Hz (10 sec).^{5,39} A coherent state reflects increased synchronization and resonance in higher-level brain systems and in the activity occurring in the two branches of the ANS, as well as a shift in autonomic balance toward increased parasympathetic activity.⁵ Importantly, there is physiological evidence that the ongoing practice of coherence-building techniques facilitates a *restructuring process* in the neural architecture where coherence becomes established as a new, stable baseline reference memory.⁴² Self-regulation of emotions and stress responses then becomes increasingly familiar and, eventually, automatic.^{5,43-45} This makes it easier for individuals to maintain their "center" and increase their mental and emotional flexibility and capacity to access all three types of intuition and remain in self-directed control.

ENERGETIC SENSITIVITY

The interaction between human beings—for example, the consultation between a patient and clinician—is a very sophisticated dance that involves many subtle factors. Most people tend to think of communication solely in terms of overt signals expressed through facial movements, voice qualities, gestures, and body movements. However, evidence now supports the perspective that a subtle yet influential electromagnetic or "energetic" communication system operates just below our conscious level of awareness that we can experience as a type of intuition that is likely an aspect of empathy.³⁸ The ability to sense what other people are feeling is an important factor in allowing us to connect or communicate effectively with others. The smoothness or flow in any social interaction depends to a great extent on the establishment of a spontaneous entrainment or linkage between individuals. When people are engaged in deep conversation, they begin to fall into a subtle dance, synchronizing their movements and postures, vocal pitch, speaking rates, and length of pauses between responses,⁴⁶ and, as we are now discovering, important aspects of their physiology can also become linked and synchronized. A review of the evidence for energetic communication is outside the scope of this article, and we will thus only provide a couple of examples that illustrate this type of intuitive capacity.

For example, an experiment investigating the energetic exchange and physiological linkage between people seated 5 feet apart found a synchronization of physiological systems between individuals. In conducting these experiments, the question being asked was straightforward; namely, can the electromagnetic field generated by the heart of one individual be detected in physiologically relevant ways in another person, and if so, does it have any discernible biological effects? To investigate these possibilities, we used signal-averaging

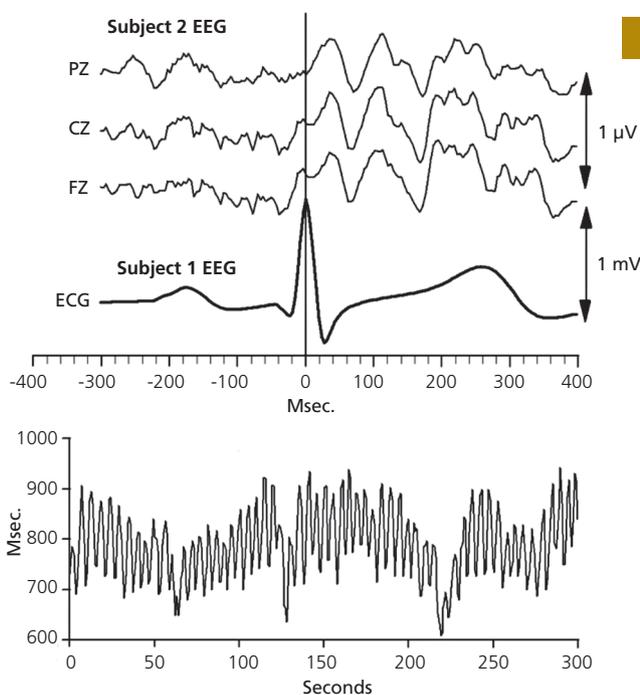


Figure 2 Heart-brain synchronization between two people. The top three traces are Subject 2's signal averaged electroencephalogram (EEG) waveforms, which are synchronized to the R-wave of Subject 1's electrocardiogram (ECG). The lower plot shows Subject 2's heart rate variability pattern, which was coherent throughout the majority of the record.

techniques to detect signals that were synchronous with the peak of the R-wave of one participant's electrocardiogram (ECG) in recordings of another participant's electroencephalogram (EEG), or brain waves.

Figure 2 illustrates the synchronization of subject two's brain waves to subject one's ECG signal. Power spectrum analysis of the signal averaged EEG waveforms showed that the alpha rhythm of subject two was synchronized to subject one's heartbeats. In this example, when the data from the same two participants was analyzed to see if subject one's EEG was also synchronized to subject two's ECG, there was no observable synchronization. The key difference between the participants was the high degree of physiological coherence maintained by subject two. In other words, the degree of coherence appears to be a key factor in linking to others' physiological activity and rhythms. This suggests that when one is in a heart-coherent mode, it facilitates a greater level of energetic sensitivity and empathy.

Another line of research that has shown physiological synchronization between people was in a study of a Spanish fire-walking ritual. Heart rate data were obtained from 38 participants, and synchronized activity was compared between fire-walkers and spectators. The researchers found finely-tuned synchronizations during the fire-walking ritual between fire-walkers and spectators who were family members or had a close relationship, but not between fire-walkers and unrelated spectators. The authors

suggest that the mediating mechanism is likely informational in nature.⁴⁷

Morris studied the effect of heart coherence in a group setting.⁴⁸ He conducted 148 ten-minute trials in groups in which three participants recently trained in shifting into and sustaining a coherent state were seated around a table with one untrained participant. During each trial, three of the trained participants were placed with one of 25 untrained volunteers to determine whether they could collectively facilitate higher levels of HRV coherence in the untrained individual. The coherence of the untrained subject was found to be higher in approximately half of all matched comparisons when the trained participants were in a coherent state. He also found evidence of heart rhythm synchronization between group participants and higher levels of coherence correlated to higher levels of synchronization between participants, which was significantly associated with relational measures (bonding) among the participants. He concluded that evidence of heart-to-heart synchronization across subjects was found, which lends credence to the possibility of “heart-to-heart bio-communications” and since energetic connections seem to be related to the quality of thoughts and emotions held in consciousness, it would be mutually advantageous for people to practice empathy in their dealings with one another.

INTUITION AND EMPATHY

Given that empathy represents an aspect of intuition in regard to energetic sensitivity and that it is implicated as an important factor in sustaining compassionate social action and positive relationships, it is pertinent to explore the nature of empathy in order to more fully understand the role it plays in making choices that uplift individual and global consciousness. Empathy is defined by the *Oxford Dictionary* as “the ability to understand and share the feelings of another.” Goleman discusses Ekman’s taxonomy of empathy, which consists of cognitive, emotional, and compassionate empathy, yielding a complex construct with numerous interacting aspects.⁴⁹ Lieberman further states that empathy is an embodied experience of a way of knowing another that goes beyond that of a cognitive map and that must be grounded in the knowledge that this experience is, in fact, an awareness of the other, rather than a personal emotional experience.³ This is significant in that compassionate empathy, as the action stemming from an empathic understanding of the experience of another, cannot be effective in uplifting consciousness to the degree that it reflects self-interested intention.

Positive social relations have been found to create a type of social coherence that attunes the heart-based wave fields of bio-emotional energy generated that links a group as a whole.⁵⁰ We suggest that as group members are attuned to the same resonant socio-emotional frequency, the group generates a powerful collective receptive field of coherent bio-emotional

energy through which nonlocal information is accessed and amplified due to a stronger resonant feedback loop, both to the field of the group and to that of the individual member.⁵¹ These dynamics rest on the ability for coherent function, intentionality, and positive emotional social intention within a supportive community.

NONLOCAL INTUITION

Two other studies in this issue add to the growing number of studies providing evidence of perception of future information.^{52,53} There is now a large body of rigorous experimental research dating back more than seven decades that has documented nonlocal intuitive perception in a variety of rigorous scientific experiments showing that it cannot be explained by flaws in experimental design or research methods, statistical techniques, chance, or selective reporting of results.⁵⁴ As both of these articles contain discussions of previous research on nonlocal intuition, we will not be reviewing it again here. We will instead focus on the broader role of nonlocal intuition in lifting human consciousness and role of the heart in this process.

As mentioned earlier, the majority of studies view intuitive perception solely as the result of implicit memories and the unconscious mind accessing forgotten information stored in the brain.^{17,33,55-58} However, we suggested that there are three types or categories of intuition: implicit knowledge, energetic sensitivity, and nonlocal. It has been suggested that the capacity to receive and process information about nonlocal events appears to be a property of all physical and biological organization and is likely due to the inherent interconnectedness of everything in the universe.⁵⁹⁻⁶¹

Given that a relationship has been established between increased heart coherence and access to intuitive intelligence,²⁹ the capacity to shift into coherent states is an important factor when considering the heart’s role in lifting consciousness. Research on intuition suggests that it is possible to access intuitive intelligence more frequently by quieting mental chatter and emotional unrest and by paying attention to one’s intuitive guidance.⁶² We have found that increased heart rhythm coherence correlates with significant improvements in performance on tasks requiring attentional focus and subtle discrimination,⁵ as well as with pre-stimulus-related afferent signals from the heart,²⁹ which are likely important elements of intuition that are particularly salient in pattern recognition, which is likely involved in all types of intuitive process.

Given the central role of the heart in creating coherence and its association with heartfelt positive emotions, it is not surprising that one of the strongest common threads uniting the views of diverse cultures, religious, and spiritual traditions throughout human history has been the universal regard for the human heart as the source of love, wisdom, intuition, courage, etc. Everyone is familiar with such expressions as “put

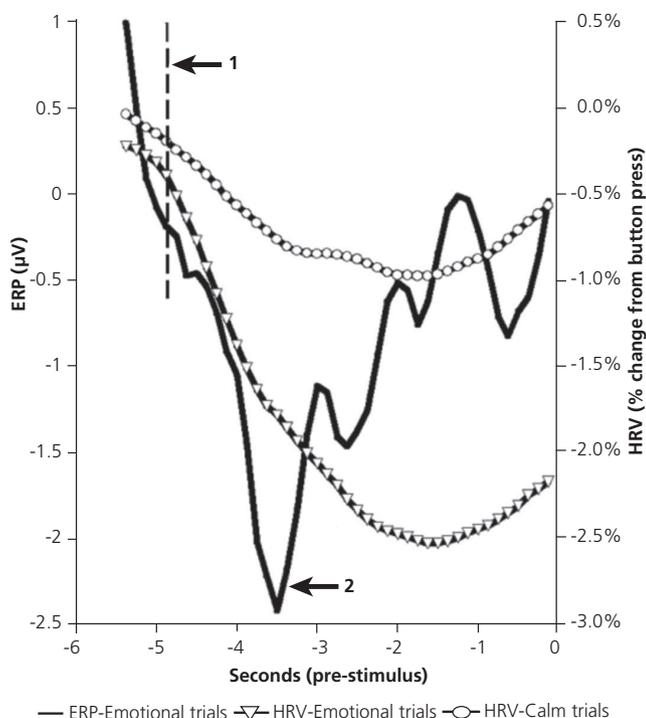


Figure 3 Example of temporal dynamics of heart and brain pre-stimulus responses. This overlay plot shows the mean event-related potential (ERP) at electroencephalogram site FP2 and heart rate deceleration curves during the pre-stimulus period. (The “0” time point denotes stimulus onset.) The heart rate deceleration curve for the trials in which a negative emotionally arousing photo would be seen in the future diverged from that of the trials that contained a calming future picture (sharp downward shift) about 4.8 seconds prior to the stimulus (arrow 1). The emotional trials ERP showed a sharp positive shift about 3.5 seconds prior to the stimulus (arrow 2). This positive shift in the ERP indicates when the brain “knew” the nature of the future stimulus. The time difference between these two events suggests that the heart received the intuitive information about 1.3 seconds before the brain did. Heartbeat-evoked potential analysis confirmed that a different afferent signal was sent by the heart to the brain during this period.²⁹

your heart into it,” “learn it by heart,” “speak from your heart,” and “sing with all your heart”—all of which suggest an implicit knowledge that the heart is more than just a physical pump that sustains life. What such expressions reflect is something that is often called the “intuitive heart” or “spiritual heart.” Throughout history, people have turned to the intuitive heart, sometimes referred to as their “inner voice,” soul, or “higher power” as a source of wisdom and guidance. Interestingly, polls conducted by the Pew Research Center find that 95% of Americans believe in some form of a higher power, as does 85% of the world’s population. The surveys also show that scientists are roughly half as likely to believe in a universal spirit or higher power.⁶³

There is compelling evidence to suggest that the physical heart is coupled to a field of information that is not bound by the classical limits of time and space.^{28,29} This evidence comes from a rigorous experimental study that demonstrated that the heart receives and processes information about a future

event before the event actually happens.^{28,29} The study’s results provide surprising data showing that both the heart and brain receive and respond to pre-stimulus information about a future event before the event occurs (Figure 3).

Even more tantalizing are clear indications that the heart receives intuitive information *before* the brain and that the heart sends a different pattern of afferent signals to the brain prior to an adverse future event that modulates the frontal cortex, as assessed with heartbeat-evoked potential analysis. In addition, when study participants were in a coherent state prior to the experimental protocols, they were significantly more attuned to the information from the heart.²⁹ This suggests that the heart is directly coupled to a source of information that interacts with the multiplicity of energetic fields in which the body is embedded.

What is meant by terms such as *intuitive heart* or *heart intelligence* is what we call the energetic heart, which is coupled to a deeper part of one’s self. Many call this their “higher self” or their “higher capacities” and is what physicist David Bohm called our implicate order and undivided wholeness.⁵⁹ We use the term *energetic systems* in this context to refer to the functions we cannot directly measure, touch, or see, such as our emotions, thoughts, and intuitions. Although these functions have loose correlations with biological activity patterns, they nevertheless remain covert and hidden from direct observation. Several notable scientists have proposed that such functions operate primarily in the frequency domain outside of time and space and have suggested mechanisms as to how they can interact with biological processes.⁶⁴⁻⁷⁰

As discussed elsewhere, the physical heart has extensive afferent connections to the brain and can modulate perception and emotional experience.⁵ Our experience suggests that the physical heart also has communication channels connecting it with the energetic heart.²⁹ Nonlocal intuition therefore is transformational; it contains the wisdom that streams from the soul’s higher information field down into the human system via the energetic heart and can inform our moment-to-moment experiences and interactions. At the Institute of HeartMath, we call this heart intelligence.

Heart intelligence is the flow of higher awareness and intuition we experience when the mind and emotions are brought into synchronistic alignment with the heart. When we are heart-centered and coherent, we have a tighter coupling and closer alignment with our deeper source of intuitive intelligence and are able to more intelligently self-regulate our thoughts and emotions, which over time lifts consciousness and establishes a new internal physiological and psychological baseline.²⁹ In other words, there is an increased flow of intuitive information, which is communicated via the emotional energetic system to the mind and brain systems, resulting in a stronger connection with our deeper “inner voice.”

TECHNIQUES FOR ACCESSING INTUITION

The research on heart-brain interactions and intuition has informed the development of a set of self-regulation techniques, known as the HeartMath System.⁷¹⁻⁷⁵ The HeartMath process offers individuals systematic and reliable techniques to intentionally increase physiological coherence and self-regulate out of a state of emotional unease or stress into a “new” positive state of emotional calm and stability. One of the techniques, called Freeze Frame,^{73,76} is a five-step process for improving intuitive capacities, stopping energy drains, and obtaining greater clarity and finding innovative solutions to problems or issues. Studies conducted across diverse populations in laboratory, organizational, educational, and clinical settings have demonstrated that these coherence-building techniques are effective in producing both immediate and sustained reductions in stress and its associated disruptive and dysfunctional emotions, together with improvements in many dimensions of health and well-being.^{5,37,76-79} Collectively, results indicate that such techniques are easily learned and employed, produce rapid improvements, have a high rate of compliance, can be sustained over time, and are readily adaptable to a wide range of ages and demographic groups.

CONCLUSION

This article explored different perspectives about the nature and types of intuition, and the connection between intuition and lifting consciousness were discussed. It was suggested that increased effectiveness in self-regulatory capacity and the resultant reorganization of implicit memories sustained in the neural architecture facilitates a stable and integrated experience of self in relationship to others and to the environment, otherwise known as consciousness.

We suggest that there are many benefits to be gained by a deeper understanding of the complex interactions between heart, brain, memory, and the energetic heart. Learning to access our deeper innate wisdom can facilitate people in unfolding who they really are and approaching personal, social, and global affairs with increased wisdom, compassion, and positive innovation. We call this state of internal and external connectedness “coherence.”

Practicing shifting to a more coherent state increases intuitive awareness and over time, the establishment of new baseline reference patterns and sustained shifts in perception and world-views from which better informed and more intelligent decisions can be discriminated. This process elevates consciousness, our awareness of self and connections with others, and our capacity for self-regulation and corresponding ability for self-directed action. As consciousness is lifted, it is possible to move beyond habitual reactivity based on automatic responses stemming from reliance on patterns of behavior that are anchored in the realm of the familiar into the realm of more creative, fitting, and effective strategies.

As the development of physiological coherence allows increased access to intuitive intelligence and as the individual’s repertoire of positive emotions and actions grows, it is natural that the enhanced experience of empathy and social coherence will lead to compassionate empathy in the form of attitudes and behaviors that facilitate and support altruistic pro-social actions. When more individuals in families, workplace, and communities increase and stabilize their coherence baselines, it can lead to increased social and global coherence and a corresponding lifting of consciousness.

REFERENCES

- Nelson R. Scientific evidence for the existence of a true noosphere: foundation for a noo-constitution in forum of spiritual culture. Astana, Kazakhstan; 2010. http://noosphere.princeton.edu/papers/pdf/noosphere_forum.3.pdf. Accessed February 26, 2014.
- Hodgkinson GP, Langan-Fox J, Sadler-Smith E. Intuition: a fundamental bridging construct in the behavioural sciences. *Br J Psychol*. 2008;99(1):1-27.
- Lieberman MD. Social cognitive neuroscience: a review of core processes in *Annu Rev Psychol*. 2007;58:259-89.
- Baumeister RF, et al. Self-regulation and personality: how interventions increase regulatory success, and how depletion moderates the effects of traits on behavior. *J Pers*. 2006;74(6):1773-801.
- McCraty R, Atkinson M, Tomasi D, Bradley RT. The coherent heart: heart-brain interactions, psychophysiological coherence, and the emergence of system-wide order. *Integral Rev*. 2009;5(2):10-115.
- Dane E, Pratt MG. Exploring intuition and its role in managerial decision making. *Acad Manage Rev*. 2007;32:33-54.
- Bechara A, et al. The Iowa Gambling Task and the somatic marker hypothesis: some questions and answers. *Trends Cogn Sci*. 2005;9(4):159-62; discussion 162-4.
- Damasio AR. *Descartes’ error: emotion, reason and the human brain*. New York: G.P. Putnam’s Sons; 1994.
- Bastick T. *Intuition: how we think and act*. New York: Wiley; 1982.
- Moir A, Jessel D. *Brainsex: the real difference between men and women*. London: Mandarin Paperbacks; 1989.
- LeDoux J. *The emotional brain: the mysterious underpinnings of emotional life*. New York: Simon and Schuster; 1996.
- Damasio A. *Looking for Spinoza: joy, sorrow, and the feeling brain*. Orlando, Florida: Harcourt; 2003.
- LeDoux JE. Emotional memory systems in the brain. *Behav Brain Res*. 1993;58(1-2):69-79.
- Evans JSBT. Dual-processing accounts of reasoning, judgment, and social cognition. *Annu Rev Psychol*. 2008;59(1):255-78.
- Bushman BJ, Baumeister RF. Threatened egotism, narcissism, self-esteem, and direct and displaced aggression: does self-love or self-hate lead to violence? *J Pers Soc Psychol*. 1998;75(1):219-29.
- Damasio AR. *The feeling of what happens*. Orlando, FL: Harcourt; 1994.
- Myers DG. *Intuition: its powers and perils*. New Haven: Yale University Press; 2002.
- Bradley RT, McCraty R, Atkinson M, Gillin M. Nonlocal intuition in entrepreneurs and non-entrepreneurs: results of two experiments using electrophysiological measures. *International Journal of Entrepreneurship and Small Business*. 2011;12(3):343-72.
- Pribram KH. *Languages of the brain: Experimental paradoxes and principals in neuropsychology*. New York: Brandon House; 1971.
- Larsen A, Bundesen C. A template-matching pandemonium recognizes unconstrained handwritten characters with high accuracy. *Mem Cognit*. 1996; 24(2):136-43.
- Craig J, Lindsay N. Quantifying “gut feeling” in the opportunity recognition process. *Frontiers of Entrepreneurship Research*. 2001:124-35.
- Halberg F, Cornelissen G, McCraty M, Al-Abdulgader AA. Time structures (shronomes) of the blood circulation, populations’ health, human affairs and space weather. *World Heart J*. 2011;3(1):1-40.
- Uyeda S, Nagao T, Orihara Y, Yamaguchi T, Takahashi I. Geoelectric potential changes: possible precursors to earthquakes in Japan. *Proc Natl Acad Sci USA*. 2000;97(9):4561-6.
- Wiseman R, Schlitz M. Experimenter effects and the remote detection of staring. *J Parapsychol*. 1997;61:197-207.
- Bem DJ. Feeling the future: experimental evidence for anomalous retroactive influences on cognition and affect. *J Pers Soc Psychol*. 2011;100(3):407-25.
- Bradley RT. Psychophysiology of intuition: A quantum-holographic theory on nonlocal communication. *World Futures: J Gen Evolution*. 2007;63(2):61-97.

27. Mossbridge J, Tressoldi PE, Utts J. Predictive physiological anticipation preceding seemingly unpredictable stimuli: a meta-analysis. *Front Psychol.* 2012;3:390.
28. McCraty R, Atkinson M, Bradley RT. Electrophysiological evidence of intuition: part 1. The surprising role of the heart. *J Altern Complement Med.* 2004;10(1):133-43.
29. McCraty R, Atkinson M, Bradley RT. Electrophysiological evidence of intuition: Part 2. A system-wide process? *J Altern Complement Med.* 2004;10(2):325-36.
30. Pribram KH, Melges FT. Psychophysiological basis of emotion, in *Handbook of Clinical Neurology*, Vinken PJ, Bruyn GW, editors. North-Holland Publishing Company: Amsterdam; 1969:316-41.
31. Ratey JJ. *A user's guide to the brain: perception, attention, and the four theaters of the brain.* New York: Pantheon Books; 2001.
32. Mayer RE. The search for insight: grappling with gestalt psychology's unanswered questions. In: *The nature of insight.* Sternberg RJ, Davidson JE, editors. Cambridge, MA: The MIT Press; 1996:3-32.
33. Hogarth RM. *Educating intuition.* Chicago: The University of Chicago Press; 2001.
34. Miller GA, Galanter EH, Pribram KH. *Plans and the structure of behavior.* New York: Henry Holt & Co; 1960.
35. Pribram KH. Feelings as monitors, in *Feelings and emotions*, Arnold MB, editor. Academic Press: New York. 1970:41-53.
36. Cameron OG. *Visceral sensory neuroscience: interoception.* New York: Oxford University Press; 2002.
37. McCraty R, Childre D. Coherence: bridging personal, social and global health. *Altern Ther Health Med.* 2010;16(4):10-24.
38. McCraty R. The energetic heart: bioelectromagnetic communication within and between people. In: *Bioelectromagnetic medicine*, Rosch PJ, Markov MS, editors. Marcel Dekker: New York. 2004:541-62.
39. McCraty R, Atkinson M, Tiller WA, Rein G, Watkins AD. The effects of emotions on short-term power spectrum analysis of heart rate variability. *Am J Cardiol.* 1995;76(14):1089-93.
40. Tiller WA, McCraty R, Atkinson M. Cardiac coherence: a new, noninvasive measure of autonomic nervous system order. *Altern Ther Health Med.* 1996;2(1):52-65.
41. Leon E, Clark G, Callaghan V, Doctor F. Affect-aware behavior modelling and control inside an Intelligent Environment. http://dces.essex.ac.uk/staff/vic/papers/2010_PMCJ10%28AffectAwareBehaviour%29.pdf. Accessed February 24, 2014.
42. Bradley RT, McCraty R, Atkinson M, Tomasino D. Emotion self-regulation, psychophysiological coherence, and test anxiety: results from an experiment using electrophysiological measures. *Appl Psychophysiol Biofeedback.* 2010; 35(4): 261-83.
43. McCraty R, Childre D. The grateful heart: the psychophysiology of appreciation, in *The psychology of gratitude.* Emmons RA, McCullough ME, editors. New York: Oxford University Press; 2004:230-55.
44. McCraty R, Atkinson M, Tomasino D. Impact of a workplace stress reduction program on blood pressure and emotional health in hypertensive employees. *J Altern Complement Med.* 2003;9(3):355-69.
45. Alabdulgader A. Coherence: a novel nonpharmacological modality for lowering blood pressure in hypertensive patients. *Global Adv Health Med.* 2012;1(2):54-62.
46. Hatfield E. *Emotional contagion.* New York: Cambridge University Press; 1994.
47. Konvalinka I, Roepstorff A. The two-brain approach: how can mutually interacting brains teach us something about social interaction? *Front Hum Neurosci.* 2012;6:215.
48. Morris SM. Facilitating collective coherence: group effects on heart rate variability coherence and heart rhythm synchronization. *Altern Ther Health Med.* 2010;16(4).
49. Goleman D. *Social intelligence: the new science of human relationships.* USA: Bantam Books; 2006.
50. Bradley RT. Dialogue, information, and psychosocial organization. In: *Dialogue and transformation.* Roberts NC, editor. London: Elsevier Science; 2002:243-88.
51. McCraty R, Deyhle A, Childre D. The global coherence initiative: creating a coherent planetary standing wave. *Global Adv Health Med.* 2012; 1(1):62-75.
52. Rezaei S, Mirzaei M, Zali MR, Bradley RT. Nonlocal intuition: replication and paired-subjects enhancement effects. *Global Adv Health Med.* 2014;3(2):5-15.
53. McCraty R, Atkinson M. Electrophysiology of intuition: pre-stimulus responses in group and individual participants using a Roulette paradigm. *Global Adv Health Med.* 2014;3(2):16-27.
54. Radin D. *The conscious universe: the scientific truth of psychic phenomena.* San Francisco, CA: HarperEdge; 1997.
55. Agor W. *Intuitive management: integrating left and right brain skills.* New Jersey: Prentice Hall; 1984.
56. Eisenhardt K, Zbaracki M. Strategic decision making. *Strategic Manage J.* 1992;13:17-37.
57. Laughlin C. *The nature of intuition: a neuropsychological approach, in intuition: the inside story.* Davis-Floyd R, Arvidson PS, editors. London: Routledge; 1997:19-37.
58. Torff B, Sternberg RJ. Intuitive conceptions among learners and teachers, in *Understanding and teaching the intuitive mind: student and teacher learning.* Torff B, Sternberg RJ, editors. Mahwah, NJ: Lawrence Erlbaum Associates; 2001:3-26.
59. Bohm D, Hiley BJ. *The undivided universe.* London: Routledge; 1993.
60. Laszlo E. *The interconnected universe: conceptual foundations of transdisciplinary unified theory.* Singapore: World Scientific; 1995.
61. Nadeau R, Kafatos M. *The nonlocal universe: the new physics and matters of the mind.* New York: Oxford University Press; 1999.
62. Petimengin-Peugeot C. The intuitive experience. In: *The view from within. First-person approaches to the study of consciousness.* Varela FJ, Shear J, editors. Imprint Academic: London; 1999:43-77.
63. Pew Research Religion & Public Life Project. <http://www.pewforum.org/2009/11/05/scientists-and-belief/>. Accessed February 26, 2014.
64. Laszlo E. *Quantum shift in the global brain: how the new scientific reality can change us and our world.* Rochester, VT: Inner Traditions; 2008.
65. Mitchell E. *Quantum holography: a basis for the interface between mind and matter,* in *Bioelectromagnetic Medicine*, Rosch PG, Markov MS, editors. New York: Dekker; 2004:153-8.
66. Pribram KH. *Brain and perception: holonomy and structure in figural processing.* Hillsdale, NJ: Lawrence Erlbaum Associates; 1991.
67. Tiller WA, Dibble J WE, Kohane MJ. *Conscious acts of creation: the emergence of a new physics.* Walnut Creek, CA: Pavior Publishing. 2001:201-2.
68. Marcer P, Schempp W. The brain as a conscious system. *Int J Gen Syst.* 1998;27:231-48.
69. Pribram KH, Bradley RT. The brain, the me and the I, in *Self-awareness: its nature and development*, Ferrari M, Sternberg R, editors. New York: The Guilford Press; 1998:273-307.
70. Schempp W. Quantum holography and neurocomputer architectures. *J Mathematical Imaging Vision.* 1992;2:109-64.
71. Childre DL. *Freeze-Frame®*, fast action stress relief. Boulder Creek, CA: Planetary Publications; 1994.
72. Childre D, Martin H. *The HeartMath solution.* San Francisco: Harper San Francisco; 1999.
73. Childre D, Cryer B. *From chaos to coherence: the power to change performance.* Boulder Creek, CA: Planetary Publications; 2000.
74. Childre D, Rozman D. *Overcoming emotional chaos: eliminate anxiety, lift depression and create security in your life.* San Diego: Jodere Group; 2002.
75. Childre D, Rozman D. *Transforming stress: the HeartMath solution to relieving worry, fatigue, and tension.* Oakland, CA: New Harbinger Publications; 2005.
76. McCraty R, Atkinson M, Tomasino D. Impact of a workplace stress reduction program on blood pressure and emotional health in hypertensive employees. *J Altern Complement Med.* 2003;9(3):355-69.
77. Ginsberg JP, Berry ME, Powell DA. Cardiac coherence and PTSD in combat veterans. *Altern Ther Health Med.* 2010;16(4):52-60.
78. Lloyd A, Brett D, Wesnes K. Coherence training improves cognitive functions and behavior in children with ADHD. *Altern Ther Health Med.* 2010;16(4): 34-42.
79. Bedell W. Coherence and health care cost—RCA actuarial study: A cost-effectiveness cohort study. *Altern Ther Health Med.* 2010;16(4).