

Emotional Arousal - The Driving Force of Life

Abstract

Emotional arousal is considered here as positive or negative experiences and expressions, based on the cognitive molding effects of the sensory – motor input and output contacts with the world. Presence of emotional arousal is a necessity as a drive for the system to initiate and execute all performances in the domains of responses and actions. It has been already proposed that an action is automatically initiated when the emotional arousal reaches a Critical Level of Potentiating (CLP). Each person learns to control own emotional arousal through social conditioning, and learns to control the occurrences of all responses and actions through control of emotional arousal. Cognitive molding of emotional arousal is the process of identifying an emotional experience and expression with a semantic expression indicating the experiential and expressive attributes in a positive to negative range. Cognitive capabilities allow us to create new concepts and relationships first virtually, and then create new realities. Emotional arousal and cognitive capabilities of the brain are the two functions of the brain that work together as the brain-mind. Emotional arousal provides the driving capability to the system, while cognitive capabilities help choose and channelize the responses and actions. Cognitive molding of emotional arousal is a core capability developed within the human system, which identifies the presence - absence of internal satisfactions, happiness or the opposite. The positive and negative effects of emotional arousal produced by cognitive judgments and reinforced by behavioral effects contribute to the personal experiences and expressions in each person.

The article deals mainly with the relevance of emotional arousal as a basic driving force, and considers the beneficial effects of learning to maintain emotional arousal in a cognitively unmolded manner so that the cognitive molding would not automatically occur and shape one's life, influencing behavioural manifestations as well as personal experiences. These may become negative and disastrous or positive and rewarding to the individual. Focus of interest here is on the presence and utilization of emotional arousal, instead of the art of developing positive thinking for molding the emotional arousal in a positive manner in life. Each individual needs to develop emotional arousal along with positive thinking, which would mold the emotional arousal positively and bring in happiness to life. Cognitively unmolded emotional arousal has been labelled 'nascent emotional arousal', which is of a unique emotion state as it allows objective view of the sensory-motor contacts made by a system, allowing impartial decisions. Those who have entered and staying in that state experience immense happiness, which they may also consider as blissful, loaded with love, without any specific personal gain from it.

Keywords: Emotional arousal; Cognitive processing; Cognitive molding of emotion; Nascent emotional state, Cognitively unmolded emotional state, Emotional arousal as the driving force of life

Introduction

The human cognitive system developed over ages, created the extraordinary understanding of human life and the universe, using which they defined their own role, the relationships with the family in terms of degrees of genetic and birth relationships, and relationships across related families, friends and others in the society. The meaningful relationships they developed using the multiple systems of the human society, have been helping controlled development and growth. Over thousands of years, each one learnt to love others within the family, friends, and those in the society with whom they shared social facilities, responsibilities and most of everything available to the self. There

were some, who could surpass the limitations of relationships with family and immediate social groups, and they shared their emotional relationship with all other human beings. Those like Goutam Buddha, Jesus Christ, and many others, and their disciples belonged to this extraordinary category of people, for whom love for others was the only force and drive that controlled their life and behaviour. Millions of people may consider them as their teachers, and shape their lives based on the values they learnt from them. There were, and still continue to have thousands of people who have been choosing a spiritual mode of life by facilitating their emotional life with spiritual ideations. Man, still has the capacity to grow such emotional attachments and allow it to control own behaviour and life. Cognitive potentialities are

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Mukundan CR^{1*} and Kacker P²

¹Axxonet Brain Research Laboratory, Axxonet System Technology, India

²Institute of Behavioral Science, Gujarat Forensic Sciences University, India

***Corresponding author:** Mukundan CR, Axxonet Brain Research Laboratory, Axxonet System Technology, Christ School Road, Bangalore 560029, India, Email: crmukundan@gmail.com

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always used for the control, facilitation, and creation of new realities, which could shape their life style and comforts, as well as the future of the world they live in, while the same cognitively molded or unmolded emotional life would always be maintained at experiential and expressive levels. However, maintaining and leading an intentionally cognitively unmolded emotional arousal requires learning isolation of emotional arousal from automatic cognitive molding effects, which needs to be cultivated by each person. Further, if cognitive processing is given priority over emotional arousal, related cognitive judgments would gain greater importance to the self, and those judgments would automatically mold one's emotional arousal. Further, the emotional experiential and expressive effects on the behavioural manifestations would be accordingly strengthened, which could become facilitatory or debilitatory to the individual.

Cognitive Molding of Emotion

Cognitive molding of emotion occurs when cognitive judgment of a happening, whether it has occurred unexpectedly, or as a response from the self or other sources. The two major components of emotion have been recognized as physiological activation and cognitive processing associated with emotional experiences and expressions. Emotion has been experientially identified as a physiological state accompanied by spectrum of changes or sensations from pain to pleasure, and flight to fight responses. Emotion in this sense is an experience or feeling induced by signals mainly from outside. Cognitive processes help the identification of the bodily sensations, interpretations of the source of its origin [1], and the effects (feelings) that the impact produces in the system. Both happiness and distress need utilization of emotional arousal, except the cognitive judgments one uses are distinctly different [2,3] in the two conditions. However, loss of emotional arousal may lead to extinction of life itself. These psychological effects belong to a spectrum of positive to negative experiences, often described between extreme happiness to sadness, and determined by the strength of susceptibility to positive or negative character or decision-making ability of the individual [4,5]. These experiential values are also associated with diverse behavioural expressions. On the other hand, emotion is also used as the (emotional) driving force within the living system, which enables it to respond as well as initiate and execute actions for goal directed activities. The driving capability in the living system comes from the presence of energy that the system has at its disposal for use, as and when needed for the system to carry out responses and actions. Therefore, emotional drive and feelings are two different dimensions of the presence of emotional effects in a living system. Experientially Cerebral cortex has the privilege to think and listen to own thoughts and thereby create awareness of own thoughts, along with the same processing of the speech spoken, heard and orthographically received in the brain. Semantic interpretations of all the signals, including those arriving from outside as well as created within, evoke both emotional responses and control behavioural manifestations. These cognitive interpretations of the experiences of the signals received and generated in the body may be interpreted as pain or pleasure, and they serve as basic emotional state of the individual, experienced as feelings by the individual. Emotion has

been primarily identified as per the feelings and the behavioural effects produced, and they are identified as positive or negative emotions in terms of their effects on the self and the behavioural expressions. Emotional experiences serve as causative for the manifestation of behavioural effects, which may cause positive effects of satisfaction and encouragement for continuing with the same outputs, or one may experience hurt, pain, and other disastrous effects. Fear, sadness, anger, aggression, flight, withdrawal, anxiety, irritability, and several more emotional labels associated with specific behaviors are molded by different cognitive judgmental effects. Such molding of emotional arousal within results in varying experiences and expressions utilized for self-management and interaction with others. Cognitive molding of own emotional state and the behavioural expressions and speech of others and oneself, determined by recognition and knowledge of personal advantages and disadvantages to every person, may become a regular habit of each person. This may render an individual to remain almost always in cognitively molded emotional state, unless one learns to come out of such state and remain in a simple emotionally aroused condition for carrying out a specific action. A living being gets into actions or responding only when it is engulfed in emotional arousal. The two components of any emotional state are always considered the internal experiences and their expressions in the two directions, while the cognitively unmolded emotional state has been seldom discussed in this context.

Emotion as Drive

As already mentioned, emotional arousal serves as the driving force for carrying out physical and mental activities. Emotional arousal is utilized as the driving force, whether its molding has been positively or negatively done by the individual. Emotion as a drive propels the system during responses, actions, and mental activities during creation of new ideas and new relationships, and serves as the fuel for initiation and execution of goal directed actions. It is the presence of the same force that one experiences as pain-pleasure etc. after cognitive molding. This driving force is the most significant contributor of life, as without the drive, the life ceases to occur. Without this drive, the organs cease to function and the total system may cease to be alive. The most important capability that one acquires through the drive is to carry out various sensory-motor contacts with all external realities as cognitively interpreted by the same brain, and it facilitates experiences originating in own body. The multiple sensory – motor contacts that one establishes and experiences and the relationships scientifically and experientially derived from the contacts are understood as the foundation of reality. As emotional experiences occur with cognitive judgments of the contacts and interactions, positively adjudged emotions have been considered facilitatory while negative emotions have been considered distressing and debilitatory. This bipolar recognition of emotional experiences and expressions made individuals think of an independent spiritual life force, which they called consciousness. Consciousness has been defined from different religious points of view as a universal life force. Scientifically we have nothing beyond emotional arousal or force, which serves as the driving force in the system, without which a life system is not

alive. Cognitive molding of emotion is a routine practice, which explains the nature of the emotional impacts on the individuals. Though emotional experiences and expressions are always cognitively molded, emotion serves as the core life force. Each individual is trained in the skills of accepting emotional drive only with cognitive molding. Through the emotionally driven physical contacts, one learns to distinguish own body from the rest of the realities around, gradually establishing an identity of the self with ability to distinguish the self from the rest of the realities around. The presence of sensory-motor functions makes the body establish multiple contacts with realities around, and these experiences become a marker for one to distinguish the self and the presence of driving force within from the rest of realities.

The strength of the self-image developed and its driving capabilities attained are the primarily resources for the utilization of emotional drive. One important aspect that is not adequately scientifically investigated is the close relationship between emotional arousal and remembrance. Several hundreds of normal subjects studied using BEOS technology [6-9] and other related studies with neurology/neurosurgery patients have indirectly shown that remembrance is always related to the emotional strength an individual's has. Past memory declines as the patients declines to have normal emotional arousal or responses in life. BEOS test results are strong indicators that remembrance of autobiographic episodes may totally disappear, if the episode had not evoked any emotional effects in the individual. Cognitive identification of the emotional arousal within, by each person strengthens self-identification and need to understand a goal for life. Emotional arousal as a drive is only the fuel available to the individual, which one could deploy in various experiences and expressions. It is the cognitive evaluation of the need for achievements and the power of the goals that one may achieve, serve as the cognitive reinforcements for making use of the emotional drive for achieving the goals in life. Emotion develops into different experiential and expressive profiles, which may be enhanced or withdrawn in different sensory-motor contacts, which may facilitate biological survival needs in the domains of fights or flights, or goal directed specific actions, which are socially accepted actions or those, which the individual may carry out for personal gratifications, as he does not have control on the drive to hold it back and withdraw the actions. Maintaining a strong emotional investment in those who live and work with each person by carrying out a creative and meaningful life may be the ideal way to pass into old age. Getting isolated without needing emotional involvements are to be avoided during this period. Human beings have always succeeded in making emotional relationships with their animal companions, when they have succeeded in receiving reciprocal emotional relationship from them, even with the vast differences in their cognitive abilities. The universality of emotional experiences and expressions is apparent from these, though the individual interpretations of the significance of the emotional experiences and expressions in each life source may be different and extensively different across different life species. Wakefulness has often been considered an important component of this drive, which is controlled at the Reticular Activating System. This capability is needed for establishing and changing sensory-motor contacts with reality

through personal recognition. Emotional changes may affect the entire bodily functions as we have been monitoring the changes in the autonomic functions caused by emotional changes or responses in the individual.

Automatic Initiation of Actions - Absence of Free Will

Several of the emotionally loaded responses from a system or living being do not require perception and awareness of the input signals for initiating responses. These preattentive emotional responses [10-21] occur when emotionally loaded signals arrive directly in the limbic system consisting of several structures from the telencephalon, diencephalon and mesencephalon, viz., hippocampus, amygdala, hypothalamus, anterior thalamic nuclei, fornix, mammillary body, septum pellucidum cingulate gyrus, parahippocampal gyrus, entorhinal cortex, and midbrain areas, which could release memory specific (flight - fight) responses of the Polyvagal system [22,23], needed for biological survival. Perception and awareness also evoke emotional arousal which may initiate actions. One thing that we are familiar with all over the world is the absence of actions when emotional drive in persons are low. Many people, even cognitively superior ones, do not achieve higher goals because of their poor drive. The system has a choice to be emotionally aroused to the level needed for the initiation of motor responses for carrying out actions which would take them to higher levels of achievements in life. The neurogenesis of actions initiated voluntarily is demonstrated by the Bereitschaftspotential [24-31], which initiates 2-3 sec before the motor potentials for the action are initiated in the brain and the action is executed. Individual becomes aware of the actions only when the motor potentials and the actions are initiated, but has no awareness of the neurogenesis of the potentials initiated well before the action. The early neurogenesis of the readiness potential made Libet [24-31] propose that we do not have 'free will' for initiation of actions, as we are not aware of the origin of the actions. However, this was not generally acceptable as one may always be aware of the intention to act. Nevertheless, the origin of several violent actions among juveniles and others has been a significantly severe problem for explanation of the genesis of such violent actions. Studying this over several years, Mukundan et al. [31] proposed that action is always automatically initiated, when emotional arousal reaches a critical limit. Enhancement of cognitively molded specific emotional arousal may occur because of specific sensory inputs. It has been proposed [31] when the increasing emotional arousal reaches a Critical Level of Potentiation (CLP), the action is automatically initiated. This proposal meant that one may initiate an action involuntarily, if the emotional arousal for the action is intense enough and it reaches the CLP. One may thereby initiate and carry out violent actions without self-control, especially when one does not have voluntary control on own emotional arousal. When one is emotionally aroused and the accompanying cognitive processing further enhances the emotional arousal, it may automatically initiate the action, when it reaches the CLP stage. If one needs voluntary control on actions, one need to develop control on the emotional arousal and keep it well below the CLP level so that the action is not initiated. Normally this capability for the control of emotional arousal develops from infancy in every

person, as the ability learnt for holding or delaying the initiation of various responses and actions, so that the child could learn to control own emotional arousal and thereby the initiation of actions. Absence of development of this capability may lead a child become hyperactive, which may lead to the development of delinquent behaviour in the child. One normally learns this ability for emotional control through social conditioning during the developmental stages. This proposal also negates the presence of free will in all, as one with poor self-control on emotional arousal would fail to hold back or initiate an action. This further indicates that all actions are also often responses, for which emotional arousal may already be present and one would initiate the responses, when the emotional arousal reaches the CLP. All are expected to have the freedom and opportunity to learn to control own emotional arousal, which would control the initiation of all actions. However, many may not receive the opportunity to learn this control, and they may require special community based rehabilitation, when they get into violent acts at later stage in life. If emotional arousal is low, no actions, even if they are necessary for growth and survival will be generated by the individual. The level of emotional arousal that one could release for self-control of initiation of actions depends on the acquisition of emotionality or emotional drive as well as its controlling ability that one has learnt in the early years of life.

Social Conditioning of Emotional Arousal

The most significant and alarming outcome of absence of adequate socialization is that it makes individuals vulnerable to criminal behavior as some people fail to control their emotional arousal. Reduced emotional control or its loss may not cause concern to the individual, while the society will be punished for it. Social objection generally arises when such behaviors hurt the interests of others and become disastrous and painful to them, as some of those actions hurt their social values and security. Further, one could also become verbally aware of the thoughts generated for wanting to carry out an action and may emotionally react with the thoughts. Emotional reactions may be generated in one by the awareness of both encoded and transcoded thoughts. Emotional arousal takes place with virtual experiences also, and individuals generally enjoy all virtual experiences and the associated emotional experiences. However, mere awareness, which is only monitoring of own thoughts and contributing to self-awareness [31-38] does not give power to control, if one does not critically think of the consequences of a proposed action. One may not also have the ability to change the contents of own thoughts, and continuous thinking of the same content in the same direction may enhance the emotional needs. In case they carry out those actions, the society may consider them disastrous. Normal social conditioning helps all to gain control over the emotional arousal and learn to inhibit such states of emotional arousal, which could lead one to execution of socially unaccepted behaviour. However, if one has not had the opportunity to go through such conditioning and learning which would give them control over emotional arousal, they may end in carrying out such nefarious actions. Those with poor self-control of emotional arousal may often indulge in socially disapproved actions. Some of them may repent after carrying out such actions. The deleterious

effects of inadequate socialization on volitional control have been demonstrated in studies [39]. Yu Go et al. [39] found relationship between absence of fear conditioning in 3 years old children and occurrence of criminal behavior 23 years later in them. They attributed the poor early fear conditioning to the absence of the functional involvement of amygdale in them. Studies by Arseneault et al. [40] and Pine et al. [41] had implicated maladaptive limbic neural developments of the brain as a marker for its poor development of emotional controls, and development of antisocial personality, psychopathy, delinquency, and criminal offensive behaviour. Birbaumer et al. [42] found that the neural activation seen in the amygdala, orbitofrontal cortex, insula, and anterior cingulate in normal subjects during delayed fear conditioning was indeed absent in the male psychopaths of their study. Strong indications of ventral prefrontal and orbitofrontal dysfunctions have been reported in persons with psychopathic behavior in studies [43-52]. Absence of fear conditioning in early stages of neural development may occur and contribute to impaired social development of individuals, even when opportunity for such social conditioning is available in the society. It may indeed affect adversely those biologically vulnerable persons, who may indulge in criminal offenses in their later life.

Interaction of Cognitive Processing and Emotional Arousal

To be emotionally aroused has been always considered ideal for gaining immense personal strength and drive, especially when the emotional arousal is triggered by causes, which help to achieve higher goals in life as cognitively interpreted by the self. On the other hand, emotion may also be cognitively molded when associated with needs and challenges, which may bring about discomfort and pain to the self and others. They turn into negative emotions, which one experiences as painful and may want to suppress or avoid. Intense emotional arousal may lower processing abilities as already defined and describe by Yerkes and Dodson [53], as there is inverse relationship between drive level and the optimum performance that one could achieve. One has to often adjust the complexity and the drive levels for obtaining an optimum performance. Cognitive abilities are often preferred and considered superior strength of the individual, as long as they are not suppressed by emotional arousal. As one may seldom have an option to decide and choose the complexity of cognitive processing and performance, one learns to control and adjust the emotional arousal to a best suited level for obtaining optimum performance. People in general never gave importance to the fact that emotion becomes positive or negative only when it is cognitively molded in those directions, despite the fact that emotion is indeed an independent driving force of life, without which there cannot be life at all. Other than the direct experiential effects of emotion, one experience other's reactions on one's own behavioral manifestations, all of which affect the course of life. Emotion has never been seriously understood in the right scientific perspective as a basic driving force of life. Emotion has always been considered with its molded effects, acceptable when it is positive and the results are gainful, to be ignored and rejected if it does not produce such positive effects or produces only negative effects in life. Importance has been always given

to cognitively mold positive emotional states, though negative emotions have been always present in life. Positive emotional states are characterized by happiness and may provide high drive for constructive efforts, while negative emotions load one with unhappiness or sadness and remove or inhibit the drive to work. The need for mastering the art of molding emotions and using emotion for facilitating activities for achieving growth have been proposed in great details from the early stages of mankind, discussed as “Sthita Prajna” elsewhere here. The most intriguing and difficult issue is to understand that cognitive processing could be easily influenced by suggestions, and suggestions could alter the behavioural effects and emotional experiences [50-53]. People have been normally accepting such suggestions as regular inducement in life, which help them mold emotions positively with desirable and acceptable effects. Inability to view and handle emotional arousal separate from cognitive processing and its molding effects, damages or blocks the view of the actions and their pursuits for achieving goals in life. As emotion is the most precious strength of all forms of life, life itself ceases when emotion stops occurring. Each child learns to apply cognitive molding as per the training that he or she receives in the family, home, school, and from friends, and later may learn to adjust them as per own needs and comforts. A major controlling factor has always been the common false understanding that being emotional is often a weakness rather than strength, as emotionality is often considered a personal weakness of an individual. People in general, in most societies consider drive needed to live as a spiritual endowment. They do not dare compare the spiritual endowment with emotional arousal, which produces positive or negative effects in the individual. Emotion is commonly used for referring to and describing relationships and its strength with others, self needs, and the usefulness of the positive - negative effects in life. However, this emotionality is always a cognitively molded state of the original nascent emotional arousal. One does not pursue the presence or state of the original drive or emotional arousal, which keeps one-self alive and gives the force for being active. Cognitive molding is generally done by everyone using one’s own personal interests of pursuits in life. If one cannot think of the needs and interest of others than that of the self, the cognitive molding would become very personal and self-oriented. It is the same emotion that provides all the strength that one needs for moving forward and carrying out all the activities required for achieving higher goals of life, despite all obstacles and difficulties in the goal directed forward movements. One has to make use of this emotional strength, which emanates only from within, for facing all the challenges in life. One could learn to experience this unique emotional state without any cognitive biases, though we seldom try to accomplish it. It is well known that such blissful emotional states occur when one reads any of their spiritual books like Bhagavatgeeta, Bible, or Quran, etc., as one succeeds from moving away from those types of cognitive processing, which mold emotions in a self-oriented manner and negatively. Love is the greatest strength of man, though it has been thrown away by many as they are engaged in strengthening themselves and in spreading hatred and destroy other human beings, who are not or cannot be loved. Emotional relationships are absent, when one is lonely and has no opportunity for interaction with others, which also increasingly detected in these days. No one may

normally want a lonely condition or world, which one does not share with others, though it is increasingly happening to many. We are emotionally aroused when we are in the process of initiating and executing actions for achieving assigned responsibilities, even though one may not have any personal gain in the activities being carried out. Emotional arousal could be the result of simple curiosity. Without drive or emotional arousal, one cannot even raise his or her little finger. Emotional arousal provides the drive needed for initiating and executing all actions that are carried out for the good of the self, family, society, and for the sake of a system for which one works and lives, and for helping other living beings. Emotional reciprocation occurs only from other living beings, with which one relates oneself, one way or the other. Such emotional reciprocation is a basic necessity for living for each person, and may be even for each animal. A man and woman enter agreement as husband and wife for such unquestionable and infinite exchange of love and emotional support to each other, which leads to the genesis of several more positive effects in life. The immense advantage of believing in a spiritual force is that one could always depend on the infinite love and affection one believes in receiving from this force. This ‘belief’ process provides immense strength and support to be emotionally aroused and allows one to live with support and strength of own faith. There is no means or logic for such emotional reciprocation from a machine, unless man installs the capability on a machine, which could be ‘expressed and experienced’ (detected) by man. However, sharing the emotional experience produced by a machine is not different from the intense emotion provoking music played by a music system.

The Experiential World

Another complex and yet not scientifically understood issue is to know if the emotional arousal is primarily a universal force, which is shared by all material bodies, and it becomes a form of life or a living being. We have already created ideas about consciousness being such a force, which when shared by matter becomes life! It is true that the question itself is not clear, though we may easily put forth such a possibility, as we are only able to relate matter with life to form a living body, and a life form can emerge only from another life form. There is no scientific way of inducing life into matter for creating a new living system. A body with life could easily be accepted, and we are also able to recognize and understand the complex mechanisms of how one life emanates from another. If we want to consider a pre-body life domain or era, or a time-space dimension where the two existed independently, we are not in a position to consider it or think about it in any scientific manner. The body-brain-mind of a human being is indeed very superior to that of any animal. Could the same life light up all different types of bodies? The differences we know are in the body-brain-mind! However, this has been indeed a very challenging issue for human beings, when they developed philosophical thoughts about the origin of the universe, the body and the mind, etc. Since these thoughts could only be conceptualized and understood at abstract levels, they are outside the realm of scientific verifications. Reality verifications were always carried out experientially from the ancient times, until man created scientific verification methods and intentionally choose the scientific methods, instead of experiential methods.

The experiential world could be real or virtual, as experiencing is essentially a mental method of verification, using physical body contacts, the signals from which are interpreted at experiential levels. Several of the experiences may remain only virtual unless proven independently and scientifically. Human beings are generally happily addicted to experiential realities even if they are virtual realities, and they may remain virtual as we are not capable of scientifically proving them. Virtual realities are continuously created in the brain, and they are transcoded for established extensive semantic explanations. Both these are phenomenal functional characteristics of the brain-mind. Many experiential proposals may remain scientifically unproven, but still acceptable to many human minds. We attribute several such scientifically unproven experiences as part of spiritual thinking, and assign them to a spiritual world. Such experiences could be produced as well as easily altered, as they are essentially parts of a virtual world, created by the brain-mind and through self-acceptance of suggestions [54-56]. Experiential verifications are generally more convincing acceptable to people than scientific verifications; they live in their world of virtual realities with happiness and satisfaction as they could experience them as per their wish and emotionally respond to such world. On the other hand, scientifically created realities are objective and could only be objectively proven, even without the brain-mind or any direct experience.

Nascent Emotional Arousal

Emotion is expressed physiologically and behaviorally and hence could be easily observed and even measured. However, when emotion is pure experiential state and not cognitively molded, it is in a nascent state. A nascent state could be characterized by strong emotional arousal, but not positively or negatively molded. One important feature of the emotional arousal state, which is cognitively unmolded, could be the absence of any personal interest in terms of gains or losses in the sensory-motor contacts, because of which the emotional arousal may said to be experienced in a positive or negative manner. However, mere curiosity does not give such positive or negative molding. One may learn to generate some impersonal interest in the emotional arousal state, by which they hold it in nascent state. A child being trained in prayers and music, etc. may learn to identify the state as one of personal endeavor and happiness and later develop immense happiness which one may learn to recognize as a blissful and happy condition, because of the intensely peaceful mental state that accompanies it. One who learns meditation as a mental exercise may also learn to identify it as a blissful and happy mental state. Such a state may arise only when one spends time observing the self and the inputs with interest, but not for identifying any other personal gains from the process. Interest and inquisitiveness are need states one easily learns and develops. It is indeed an experiential state, which one prefers to identify as happiness, but different from all those moments of happiness one may experience with specific achievements, whether the achievements are at material or other person levels. It is true that one may meditate with or without the thoughts of achieving a higher spiritual power, which is purely a personal matter of choice. This is also the period when one would learn to identify

and monitor signals from own body in the same manner as one would monitor the signals from the outside world, and learn to be objective in all self-evaluations. Once the capability to remain in the nascent state is developed, one feels not only satisfied with it, but also enjoys the experience of that state of emotional arousal, a lot more than what one may experience during positive personal gains, provided the individual has already developed the right mind set for needing and developing such a life style. As it is essentially an experiential state with minimal bodily functional accompaniments, there are scientific evidences supporting the effects of the process involved. Experiencing emotion in this state requires extensive personal training. One must stop thinking either in a positive or negative manner about the changes that may occur in one's surroundings, or as responses from other individuals. It is indeed a state when one stops thinking or expecting any positive or negative materially gainful effects for the self. This state has been described as a state of "Sthita Prajna" in Indian Vedic philosophy. The scientific interpretation of the state and its functioning has been discussed elsewhere by the author [57,58]. The most significant aspect of the state of mind associated with "Sthita Prajna" is the acceptance of all original signals and the intentions as expressed by others in their behavioral responses, without making any effort to cognitively interpret the meaning conveyed by others and react to them. One is advised to accept the responses from others without making any personal effort to automatically react to them. The mind in "Sthita Prajna" state is expected to understand the inputs in the most objective manner and respond to them with equal objectiveness, as equivalent to scientific methods, without considering any personal benefits or losses. The observer then truly emphasizes with the other person(s), and experiences the same emotional effects. A further decision could be independently made if the behaviour of the other person does not support the system that one wants to support.

Another interesting aspect has been the equivalent consideration of emotional arousal and consciousness. Consciousness and 'being conscious' indeed have different meanings, as consciousness means the presence of an independent force or entity in the body and mind, and in the universe, which may also be shared by every living being or may be just human beings alone. Being conscious is medically or biopsychologically defined as a psychophysiological state of being able to make sensory - motor contacts with the world as well as monitor the contacts. Yet another important feature of being conscious is the state of being awake, which facilitate the monitoring and knowing the same, as well as being able to verbally transcode the experiences and own thoughts which help one to become verbally aware of the thoughts [37,38] created. Wakefulness is indeed a closely related function as emotional arousal, as both are primarily controlled by adjacent subcortical areas of the brain. However, emotional experiences and even expressions could occur not only in wakefulness but also in sleep. A cognitively molded positive relationship is generally defined as love, affection, happiness, etc. whereas the negatively molded emotions may be considered as dislike, hatred, aggression, anger, etc. [8,9]. These could become highly aroused emotional states, which could trigger strong positive or negative actions. On the other hand, when emotional arousal is not present,

despite normal stimulation by other individuals, the emotional arousal is considered low and not strong enough for the initiation of any response or action from the affected individual. Intentional maintenance of such low emotional arousal is the characteristic feature of being in "Sthita Prajna" state. There is indeed no additional specific function known that of body-mind, which cannot be explained within the interactive functional domains of brain-body, and which could be attributed to consciousness alone. It is true that we could easily think of the presence of several self-contradictory functions, though they can never occur in reality. For example, there is the interesting story of a boy heating water in a vessel, when water in half the vessel starts boiling, while the remaining water becomes ice. Our ancestors, several thousand years back, could think of using rockets and atomic bombs as weapons of war, though they fired the rocket as an arrow from their bow, which hit the target and exploded as a bomb. We all continue enjoying science fiction.

Empathetic Reactions

Molding of emotional arousal using the cognitive judgments of the input signals and the changes in the state of the self may often be a frequent process, supported in every individual. When one is able to experience the same feelings of another person, with minimal communication, one is said to be capable of empathy. One experiences the same feelings, which one believes that the other is going through. Orbitofrontal Cortex and Anterior Cingulate Cortex have special role in the generation of such emotional empathy [59-64]. Nascent emotional arousal is said to be present only if one does not emotionally react to the input signals, despite being empathetic or own remembered autobiographic episodes. Ability to be empathetic is indeed a superb human quality, though one may generally produce such emotional experiences only with those who are able to strike a emotional relationship with each other. There are millions of human beings, and each one may have emotional relationship established only with a limited few, a hundred or less. But each share the world with several millions of them, life of each is influenced by the actions carried out by several known and unknown persons, as all share the same world facilities. Empathy is an important normal emotional response that develops in all individuals, and was considered an aspect of the Theory of Mind [64-66], which explains most of social interactions at the affective and cognitive levels. In empathetic reactions, an individual experience the same or part of the same emotional reactions seen by one in another person, without ever going through the same experiences that could have produced such emotional responses in the other individual. Empathetic responses may be either positive or negative, but the same as observed in another individual. Detection of presence of positive emotional relationship is the most important criterion for establishing continuous contacts with other human beings. Significant such emotional relationship develops commonly among individuals, when they relate themselves as parents and children, husband and wife, or lovers, siblings, teacher and students, and dear friends, etc. When one is in a state of "Sthita Prajna", one is able to experience ((to empathize) and understand the emotional expressions of others, but without directly responding to them. Response could take place only after adequate

cognitive judgments of the effects of such reactions are made and when one has to make decisions of the short-long term effects of the reactions, considering their positive and negative effects. Each person is expected to cultivate this habit in all emotional reactions. There are hundreds of thousands or millions of human beings around each person, who form the human society, though one establish personal emotional relationship with only very limited number, may be 10 to 100 of people from them, while one establishes social relationships with many others as they all share common social and physical facilities for their living. Presence of empathetic responses indicates that personally significant relationships are not necessarily needed for the occurrence of an emotional experience, which could empathize with another person. Empathetic responses indicate the presence of normal emotional arousal system in a person and his ability to share normal emotional responses with others. Empathetic responses may occur even without one's own knowledge.

Expression of Emotion as Devotion

There is indeed a very special relationship between religion and emotional arousal, as all religions foster the intense development of emotion within each individual towards the 'all mighty force', as proposed in the religion. All religions inspire people to have love and immense attachment with the spiritual force, and it has been generally defined as devotion. The happiness and inspiration to live in those who believe in such spiritual force depend on the devotional love they develop. Therefore, devotion is a very special and intensely channelized emotional expression of emotional arousal directed to a force at higher level, which we consider a spiritual level. Love has been considered in all religions as the most powerful force of life, and love devoted to this higher force is expected to create such immense emotional driving power in each individual. We all believe in the dearest Jesus Christ who sacrificed his own life for the love and welfare of the whole humanity. History of human beings has several persons who have dedicated their own lives for the welfare of others. Creating the same drive without such devotional dedication is indeed possible but difficult for majority of individuals, unless they develop understanding of self-generated need for emotional arousal and the tasks they have to accomplish in life. They need to create and sustain such emotional force within, on their own, for accomplishing complex and difficult pursuits of life. Their happiness and success in life may depend on this faith in their devoted emotional expressions and experiences that they may learn to develop. Such devotion, which serves to create emotional arousal within, is the means with which one could relate oneself with higher ideas. Their happiness and success in life depend on the strength of their devotion to the idea. Emotional arousal is experienced as devotion by many persons, who believe in such force. Each religion expects all the individuals within its domain; develop such devotion to the supreme force referred in its discipline. The devoted people may experience devotion in such emotional arousal. On the other hand, absence of faith may become a weakness of the self in some.

Learning to Experience Unmolded Emotional Arousal

Surprisingly cognitive molding of emotion and the resultant spontaneous emotional expressions through behaviour were

known, several thousands of years back. The method for staying without cognitive molding of emotion has been the practice in meditation or while practicing prayers, or engaging in practices which could produce an equivalent state of mind. Another realm of practicing such emotional state is by engaging in singing as well as listening to special types of music, and it could also be through practice of classical dancing methods. Meditation facilitates sensory-motor coordination at sublime levels of signal generation and produce equally sublime states for knowing or becoming aware of the sensory-motor changes within, and associated emotional arousal states. The emotional arousal gradually becomes unmolded during such processing states, as no specific cognitive processing is encouraged while meditating, and during occasion OD singing-listening to music. It may be initially necessary to leave creative thinking altogether, while practicing singing or listening to music, which facilitates one to learn an established method, which can be achieved only through maintaining a state of nascent emotional arousal. The emotional arousal may essentially be molded by focused attention, devotion, and sublime emotional arousal, which would help one to absorb instructions and practice the mental exercises without any additional emotional effects. While praying, one may worship and aspire for the care and love of a superior force, and would learn to experience emotions of happiness and blessings during those moments. One would learn to spend short periods of time moving away from the challenges of life and especially the exciting and distressing effects. Praying may be practiced every day from childhood and those moments spent in praying could become exceptional moments of emotional arousal, which could also facilitate mental states of "Sthita Prajna", when one could examine everything happening around and within in totally objective manner [50], without emotionally reacting to them. Meditation could also train one in learning similar effects on the self, when one learns to observe the self and changes occurring physically and mentally in objective manner, instead of emotionally reacting to such changes. The unaffected emotional ambience helps one to make objective observations and constructive decisions about the causative factors so that one could dedicate the self for goal directed planned actions. Further, praying does not require any further skill as it may be done for the sake of achieving such nascent emotional arousal state or with faith and hope to obtain divine support for strengthening own efforts. Earlier, it was a compulsory practice for all, including children to spend some time in praying every morning and again at night before sleeping. However, the practice has been almost given up now. This happened mainly because praying has been earlier considered mainly as a spiritual practice for the blessings of the higher force, which has been largely given up by most in the society. Prayers and singing were daily practiced even in schools, which are irregularly practiced in some schools now, except as competitive items for students. Children therefore do not get opportunity to develop the nascent or Sthita Prajna state of emotional arousal, unless we develop new methods for developing such mental state with nascent emotion arousal. Emotional expressions and experiences are molded from birth, by the physical comforts and discomforts and reinforcements offered by the parents and others, who bring up the infant. The child learns the art of cognitive molding of emotions along with cognitive processing skills, and all emotions get positively or

negatively molded though behavioural reinforcements. Learning cognitive processing abilities is always more important in life than learning molding or shaping emotional experiences and expressions, which one may often automatically learn through social conditioning. Errors in the cognitive judgments of various human interactions and the resultant emotional reactions may gradually become debilitating to the individual as they reinforce negative emotional reactions, which increasingly strengthen disturbing behavioral manifestations. The errors made in the cognitive judgments derived on the behavioural interactions of others may result in emotional disturbances, which in turn may affect the peace of mind of the affected individuals and strengthen abnormal behavioural responses in them. Hence cognitive judgments could easily acquire important strategic values in shaping the emotional responses in individuals. These emotional and behavioural disturbances often become intensely serious issues to individuals, requiring corrections in their cognitive judgments and emotional response patterns through therapeutic supports as in Cognitive Behaviour Therapy [64-68] and Emotion Focused Therapy [71-74]. One has the opportunity to learn to mold own emotions and its intensities as per the best cognitive judgment one could arrive at for the sake of best personal comforts and well-being. However, maintaining such mind set is not part of any current social learning packages in any human society, though such specific practices are advised from ancient times for fostering mental health of individuals in the societies.

Emotional Regulation through Meditation & Music

The most advanced method of controlling emotional arousal without the use of pharmacological agents has been through the practices of meditation, which is presently considered a nonreligious technique. The emotional effects of meditation have been extensively described and discussed elsewhere [75-82]. Meditation is indeed the most scientific method for the control of emotional arousal, though it would involve cognitive practices of heightened and focused attention and processing with minimal intake of signals. Control of sensory-motor contacts that one practices at a base level in meditation provides immense personal strength to the individual for extensive body-mind regulation. Most of the meditation types are practiced as a nonreligious body-mind training program. Development of the concept of emotional intelligence [82,83] further enhanced the scientific interests in understanding and application of practices for learning emotional regulation. There is need for enhanced emotional arousal as the life fuel, which is a unique psychobiological energy needed by each living being to develop and grow. Absence of positive emotions takes away the urge to live and 'act'. Each infant has to learn the development of positive emotional arousal/drive within and learn to apply it for carrying out actions for achieving various predecided goals in life. We have already succeeded in developing computer systems for cognitive or equivalent signal processing, and succeeded in developing machine learning capabilities. Emotional development is equally important and more basic than intellectual development, as emotional arousal is what provides the driving force or the fuel needed for moving, working, and carrying out all physical and mental actions, many of which may be the selected ones for greater achievements in life, until one reaches the predicted and designated goals. Not having emotional

arousal is like having a magnificent vehicle for travel, but without any fuel within. We have indeed learnt to use a computer in the place of the brain for carrying out complex machine controls for signal managements as well as signal processing. Absence or reduced emotional arousal or drive causes severe problems to human beings even if they have abundance of cognitive processing capabilities. Absence or reduced emotional arousal or drive fails each one to initiate actions as well as execute them for achieving various goals in life. We have never been able to substitute emotional arousal by any other driving force in living beings. We are not in a position even to think of developing a life-fuel or driving material equivalent to emotion, or engage a living being with the force of an external driving system, which can mechanically or physiologically facilitate movements, responses and actions. The only way to facilitate the driving force in human beings or even in animals is to offer them greater rewards, as traditionally done and practiced in animal laboratories, which may make them work harder. We have already developed and carried out the equivalent drive function at the machine levels, and created millions of moving vehicles and objects in the sky, on the roads, and in the water, but not directly at the biological level. Giving food may indeed fulfill an essential biological need for growth, survival, and provide physical strength, except providing the psychobiological emotional driving force. Those, who believe in the existence of an ultimate spiritual reality, always propose the existence of a reality beyond emotion, considered as a spiritual force in the universe. This thinking has added the concept of consciousness as a spiritual force beyond emotional arousal and cognitive abilities, proposed to be present at a level (? spiritual) beyond psychobiological or physical levels. Thoughts about spiritual existence are essentially experientially originated conceptualizations, even though experiences could be made to fall outside the domains of scientific thinking and verifications. Human beings have successfully created concepts of several loving and beautiful ultimate forces at a spiritual level, and also wild, devilish, and demolishing ones. Experiencing is a subjective interpretation of the sensory-motor contacts with reality one makes, without using any other objective or scientific verification methods. Spiritual realizations are essentially experiential, and they form the strength of life in many. Origin of emotional arousal has been always considered experiential as it depends mainly on the cognitive judgments personally made by one, without any objective verification. Emotion has been always discussed as positive or negative, i.e. in its cognitively molded states causing advantages or disadvantages to life. The only extraordinary condition has been the emotional state achieved during meditation, and other states achieved during praying, singing, listening to music, etc., which has been categorized here as nascent emotional arousal.

Conclusion

Critical consideration of emotional arousal before it is cognitively molded helps us to understand the true nature of emotional arousal in human beings and possibly in other forms of life. Emotional arousal in its original state, when it is not cognitively molded, is the true nature of emotion, serving as a driving force of life. Any movement, action or response of a living system is possible only if it is endowed with emotional arousal.

Cognitive processing molds the emotional arousal and it is experienced as feelings, and still serves as the drive for 'specific' movements, responses and actions. Most of the cognitively molded emotional arousal states become highly specific forces that propel specific behavioural responses. However, one could experience emotional arousal even when it is not cognitively molded. Once the cognitive molding takes place, the same arousal is experienced as the drive for a specific purpose, which may be of greater experiential value to the individual, as it has been already molded in a particular format. It is a fact that emotion has always been considered as a positive or negative force, as cognitively determined, though it has an unmolded nascent origin and it could be even maintained in that manner. One needs a higher level of vision and understanding to take the drive as nascent life force, and apply it wherever one wants it. One could maintain that state only during spiritual moments especially during meditation and praying etc., and hence it came to be considered a spiritual state rather than a normal condition. Though the word emotional arousal or drive has been frequently used, it is always its molded effect that came to be considered with utmost seriousness and for explanations of behaviour. The valence came to be considered with greater value than its driving effect. Formulating the ideas within scientific boundaries, emotional arousal is the only driving force available, despite the fact we may identify it in multiple cognitively molded in terms of the personal interests of the person. Presence of a state of mind with nascent emotional interest may not be understood by others, as everyone views another person and his/her responses and actions from one's personal interest. Applications of various cognitive processes for shaping the sensory-motor contacts and molding own emotional drive for applications appear as purpose specific and in specific directions. Nevertheless, we do have individuals, who work only for the benefit of a system, which they may be trying to build and support, and who is always controlled by principles of living, rather than personally beneficial gains in life. The integrated approach of cognitive processing and emotional arousal have given immense powers to human beings to become creative, and to change existing realities, as well as create totally new realities in the world. The physical and functional world has been going through fascinating changes and these processes will continue to happen as long as human beings keep working on them.

Remaining emotionally aroused strongly maintains the basic need of being alive and functional. Presence of nascent emotional arousal further enhances conflict free state of mind, though one has the rightful option to be emotionally very positive or even negative after adequate and objective cognitive judgments of an event or situation. Such cognitively unmolded emotional arousal helps one to remain healthy and creative. One must learn to experience and use the emotional arousal as the primary drive, as well as learn to cognitively mold down own primary emotional arousal positively or negatively with total control on such molding processes. The happy and blissful nascent emotional arousal does not occur automatically; we do have to learn the art of being emotionally aroused to high levels in such mode, 'without allowing cognitive blasts induce positive or negative emotional biases', which is indeed possible through the practices already mentioned here. Cognitive processing helps each individual to create a meaningful world with which one relates and lives in, and

one's own blissful emotional arousal may be molded into multiple positive experiences in such process. One has to learn to change the cognitive evaluations of the world, when critical thinking supports such creative changes in the world around. Love indeed is the strongest emotional aid for facilitating and maintaining such emotional arousal, which could always be supported by practices of meditation, praying, listening to and singing spiritual types of music, etc., and by exchanging affection or love to others.

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Conflict of Interest

None.

References

- Schachter S, Singer J (1962) Cognitive, Social, and Physiological Determinants of Emotional State. *Psychol Rev* 69: 379-399.
- Fredrickson BL (2009) *Positivity*. Crown, USA.
- Cohn MA, Fredrickson BL, Brown SL, Mikels JA, Conway AM (2009) Happiness unpacked: positive emotions increase life satisfaction by building resilience. *Emotion* 9(3): 361-368.
- Peterson C, Seligman MEP (2004) *Character strengths and virtues: A handbook and classification*. Oxford University Press/Washington, USA. pp. 800.
- Peterson C (2006) *A Primer in Positive Psychology*. Oxford University Press, USA.
- Mukundan CR (2014) Neuroscience Techniques for Forensic Examination of Suspects. In: (Eds.) YK Nagle, K Srivastava, A Gupta. *Handbook of Forensic Psychology*. Author House, UK, pp. 137-167.
- Mukundan CR (2011) Scientific methods of extraction of information from suspects: An analysis of current trends. *Indian Journal of Clinical Psychology* 38(2): 129-140.
- Mukundan CR (2010) Reading from memory: a paradigm shift for deception detection in investigative psychology. *Amity Journal of Applied Psychology* 1(1): 24-34.
- Mukundan CR, Vaya S (2004) Brain electrical activation fingerprinting. *CBI Bulletin* 12(10): 29- 37.
- LeDoux J (1996) Emotional networks and motor control: A fearful view". *Progress in Brain Research* 107: 437-446.
- LeDoux J (1998) Fear and the brain: Where have we been, and where are we going? *Biol Psychiatry* 44(12): 1229-1238.
- LeDoux J (2003) The emotional brain, fear, and the amygdala". *Cellular and Molecular Neurobiology* 23(4-5) 727-738.
- Morris JS, Öhman A, Dolan RJ (1998) Conscious and unconscious emotional learning in the human amygdala. *Nature* 393(6684): 467-470.
- Whalen PJ, Rauch SL, Etcoff NL, McInerney SC, Lee MB, et al. (1998) Masked presentations of emotional facial expressions modulate amygdala activity without explicit knowledge. *J Neurosci* 18(1): 411-418.
- Soares JJ, Ohman A (1993) Preattentive processing, preparedness and phobias: Effects of instruction on conditioned electrodermal responses to masked and non-masked fear-relevant stimuli. *Behavior Research and Therapy* 31(1): 87-95.
- Soares JJ, Ohman A (1993) Backward masking and skin conductance responses after conditioning to nonfeared but fear-relevant stimuli in fearful subjects. *Psychophysiology* 30(5): 460-466.
- Windmann S, Kruger T (1998) Subconscious detection of threat as reflected by an enhanced response bias. *Conscious Cognition* 7(4): 603-633.
- De Gelder B (2005) Unconscious fear influences emotional awareness of faces and voices. *Proceedings of National Academy of Sciences (PNAS)* 102(51): 18682-18687.
- De Gelder B, Vroomen J, Pourtois G, Weiskrantz L (1999) Non-conscious recognition of affect in the absence of striate cortex. *Neuroreport* 10(18): 3759-3763.
- De Gelder B, Rouw R (2000) Paradoxical configuration effects for faces and objects in prosopagnosia. *Neuropsychologia* 38(9): 1271-1279.
- Bishop SJ, Duncan J, Lawrence AD (2004) State anxiety modulation of the amygdala response to unattended threat-related stimuli. *J Neurosci* 24(46): 10364-10368.
- Porges SW (2001) The polyvagal theory: phylogenetic substrates of a social nervous system. *Int J Psychophysiol* 42(2): 123-146.
- Porges SW (1998) Love: an emergent property of the mammalian autonomic nervous system. *Psychoneuroendocrinology* 23(8): 837-861.
- Libet B (1978). Neuronal vs. subjective timing, for a conscious sensory experience. In: Buser PA & A Rougeul-Buser (Eds.) *Cerebral Correlates of Conscious Experience*, Amsterdam, USA, p. 69-82.
- Libet B (1985) Unconscious cerebral initiative and the role of conscious will in voluntary action. *The Behavioural and Brain Sciences* 8: 529-566.
- Libet B (1999) Do we have free will?. *Journal of Consciousness Studies* 6(8-9): 47-57.
- Libet B (2000) Consciousness, free action and the brain. *Journal of Consciousness Studies* 7(10): 3-22.
- Mukundan CR, Singh Jaswinder, R Ray, Desai Nimesh G (1986) Bereitschaftspotential in alcoholics. *Biological Psychiatry* 21(11): 10901092.
- Khanna S, Mukundan CR, Channabasavanna SM (1989) Bereitschaftspotential in melancholic depression. *Biol Psychiatry* 26(5): 526-529.
- Madhavi R (1999) *Slow DC Potentials and the Study of Volition*". Ph.D. thesis submitted to National Institute of Mental Health & Neuro Sciences, Deemed University, Bangalore.
- Mukundan CR, Ajayan P, Kacker P, Chetan SM, Vyas JM (2014) Violent Behavior: Absence of Social Conditioning of Drives during Neurodevelopmental Stages. *International Journal of Indian Psychology* 2(1): 1-33.
- Mukundan CR, Ajayan P (2011) *Awareness and Self-Image*". *Indian Journal of Clinical Psychology* 38(1): 37- 48.
- Mukundan CR, Priyanka K (2014) *Concept of consciousness in Philosophy and Neuroscience*. *The International Journal for Transformation of Consciousness* 1(1): 85- 95.

34. Mukundan CR (2016) Assigning Meaning to Emotional Arousal. *International Journal of Indian Psychology* 3(4): 11-33.
35. Mukundan CR (2016) Emotional Experience and Expressions. *International Journal of Indian Psychology* 3(3): 1-28.
36. Mukundan CR (2016) Emotion - Arousal and Control. *International Journal of Indian Psychology* 3(2): 1-25.
37. Mukundan CR (1999) Power of Words: Neuro-cognitive Approach for Understanding Brain Mechanisms of Awareness. In: MG Sangeetha Menon and Narasimhan, (Eds.), *Scientific and Philosophical Studies on Consciousness*. National institute of Advanced Studies, India, pp. 127-136.
38. Mukundan CR (1998) From perception to thinking - Verbal adaptation in human brain". In: JR Isaac and H Purendu. (Eds.), *Proceedings of International Conference on Cognitive Systems*, Allied Publishers, India.
39. Gao Y, Raine A, Venables PH, Dawson ME, Mednick SA (2010) Association of Poor Childhood Fear Conditioning and Adult Crime. *American Journal of Psychiatry* 167(1): 56-60.
40. Arseneault L, Tremblay RE, Boulerice B, Séguin JR, Saucier JF (2000) Minor physical anomalies and family adversity as risk factors for violent delinquency in adolescence. *Am J Psychiatry* 157(6): 917-923.
41. Pine DS, David Shaffer, Irvin Sam Schonfeld, Mark Davies (1997) Minor physical anomalies: modifiers of environmental risks for psychiatric impairment?. *Journal of American Academy Child Adolescent Psychiatry* 36(3): 395-403.
42. Birbaumer N, Veit R, Lotze M, Erb M, Hermann C (2005) Deficient fear conditioning in psychopathy: a functional magnetic resonance imaging study. *Arch Gen Psychiatry* 62(7): 799-805.
43. Lorber MF (2004) Psychophysiology of aggression, psychopathy, and conduct problems: a meta-analysis. *Psychol Bull* 130(4): 531-552.
44. Patrick CJ (2006) Getting to the heart of psychopathy". In: H, Herve, and J.C. Yuille (Eds.), *Psychopathy: Theory, Research, and Social Implications*. Hillsdale, NJ, Erlbaum, 207-252.
45. Raine A (1993) *The Psychopathology of Crime: Criminal Behavior as a Clinical Disorder*. Academic Press, USA. pp. 377.
46. Raine A (2008) From genes to brain to antisocial behavior. *Current Directions in Psychological Sciences* 17: 323-328.
47. Raine A, Yang Y (2006) Neural foundations to moral reasoning and antisocial behavior. *Soc Cogn Affect Neurosci* 1(3): 203-213.
48. Blair RJR (2007) The amygdala and ventromedial prefrontal cortex in morality and psychopathy. *Trends Cogn Sci* 11(9): 387-392.
49. Blair RJ, Cipolotti L (2000) Impaired social response reversal: a case of acquired sociopathy. *Brain* 123(pt 6): 1122-1141.
50. Yerkes RM, Dodson JD (1908) The relation of strength of stimulus to rapidity of habit-formation. *Journal of Comparative Neurology and Psychology* 18(5): 459-482.
51. Gruzelier JH (2000) Redefining hypnosis: theory, methods and integration. *Contemporary Hypnosis* 17(2): 51-70.
52. Gruzelier JH (2006) Frontal functions, connectivity and Neural Efficiency Underpinning Hypnosis and Hypnotic Susceptibility. *Contemporary Hypnosis* 23(1): 15-32.
53. Mukundan CR (2013) Frontal Cortex and Recognition: Neurocognitive Findings of Hypnosis. *Indian Journal of Health & Welfare* 4(4): 703-710.
54. Mukundan CR (2015) *Brain at Work: Neuroexperiential Perspectives*. Atlantic Publishers, India.
55. Mukundan CR et al. (2017) Sthita Prajna: A State to Control Cognitive Molding of Emotional Arousal". In: Jitendra Mohan (Ed.), *Emerging Contours of Excellence*, Publication Bureau, Punjab University, India, p. 24-40.
56. Mukundan CR (2017) *Emotion - The Driving Force*, Redshine Publication, India, pp. 302.
57. Decety J, Jackson PL (2004) The functional architecture of human empathy. *Behavioral and Cognitive Neuroscience Reviews* 3(2): 71-100.
58. Decety J, Sommerville JA (2003) Shared representations between self and other: a social cognitive neuroscience view. *Trends in Cognitive Science* 7(12): 527-533.
59. Jackson PL, Eric Brunet, Andrew N, Jean Decety (2006) Empathy examined through the neural mechanisms involved in imagining how I feel versus how you feel pain: An event-related fMRI study. *Neuropsychologia* 44: 752-761.
60. Baird A, Dewar BK, Critchley H, Dolan R, Shallice T, et al. (2006) Social and emotional functions in three patients with medial frontal lobe damage including the anterior cingulate cortex. *Cogn Neuropsychiatry* 11(4): 369-388.
61. Shamay-Tsoory SG, Harari H, Aharon-Peretz J, Levkovitz Y (2010) The role of the orbitofrontal cortex in affective theory of mind deficits in criminal offenders with psychopathic tendencies. *Cortex* 46(5): 668-677.
62. Shamay-Tsoory SG, Tomer R, Berger BD, Goldsher D, Aharon-Peretz J (2005) Impaired "affective theory of mind" is associated with right ventromedial prefrontal damage". *Cogn Behav Neurol* 18(1): 55-67.
63. Ramachandran VS (2011) *The tell-tale brain: a neuroscientist's quest for what makes us human*. W.W. Norton, USA, pp. 384.
64. Brewin C (1996) Theoretical foundations of cognitive-behavioral therapy for anxiety and depression. *Annu Rev Psychol* 47: 33-57.
65. Beck JS (2011) *Cognitive behavior therapy: Basics and beyond*. (2nd edn), The Guilford Press, USA. p. 19-20.
66. Benjamin CL, Puleo CM, Settapani CA, Brodman DM, Edmunds JM, et al. (2011) History of cognitive-behavioral therapy in youth. *Child Adolesc Psychiatr Clin N Am* 20(2): 179-189.
67. Kingdon D (2009) *Cognitive-behavioral Therapy in Severe Mental Illness*, Psychiatric Times 26.
68. Lynch D, Laws KR, McKenna PJ (2010) Cognitive behavioural therapy for major psychiatric disorder: Does it really work? A meta-analytical review of well-controlled trials. *Psychol Med* 40(1): 9-24.
69. Greenberg LS, Laura N Rice, Robert Elliott (1993) *Facilitating emotional change: the moment-by-moment process*. Guilford Press, USA. pp. 346.
70. Greenberg LS, Safran JD (1987) *Emotion in psychotherapy: affect, cognition, and the process of change*. The Guilford clinical psychology and psychotherapy series. Guilford Press, USA. p. 19-29.
71. Goldman RN, Leslie S Greenberg, Lynne Angus (2006) The effects of adding emotion-focused interventions to the

- client-centered relationship conditions in the treatment of depression. *Psychotherapy Research* 16(5): 537-549.
72. Greenberg LS (2012) Emotions, the great captains of our lives: their role in the process of change in psychotherapy. *Am Psychol* 67(8): 697-707.
 73. Cahn BR, Polich J (2006) Meditation States and Traits: EEG, ERP, and Neuroimaging Studies. *Psychol Bull* 132(2): 180-121.
 74. Lou HC, Kjaer TW, Friberg L, Wildschiodtz G, Holm S, et al. (1999) A 15O-H₂O PET study of meditation and the resting state of normal consciousness. *Hum Brain Mapp* 7(2): 98-105.
 75. Baerentsen KB (2001) Onset of meditation explored with fMRI. *Neuroimage* 13(6): S297.
 76. Newberg A, Alavi A, Baime M, Pourdehnad M, Santanna J, et al. (2001) The measurement of regional cerebral blood flow during the complex cognitive task of meditation: A preliminary SPECT study. *Psychiatry Res* 106(2): 113-122.
 77. Newberg A, Pourdehnad M, Alavi A, d'Aquili EG (2003) Cerebral blood flow during meditative prayer: Preliminary findings and methodological issues. *Percept Mot Skills* 97(2): 625-630.
 78. Azari NP, Janpeter, Gilbert, Michael, Harald, et al. (2001) Neural correlates of religious experience. *European Journal of Neuroscience* 13(8): 1649-1652.
 79. Ritskes R, Merel, Hans, Klaus, Tue Hartman, et al. (2001) MRI scanning during Zen meditation: The picture of enlightenment? *Constructivism in the Human Sciences* 8(1): 85-90.
 80. Lehmann D, Faber PL, Achermann P, Jeanmonod D, Gianotti LR, et al. (2001) Brain sources of EEG gamma frequency during volitionally meditation-induced, altered states of consciousness, and experience of the self. *Psychiatry Res* 108(2): 111-121.
 81. Lutz A, Greischar LL, Rawlings NB, Ricard M, Davidson RJ (2004) Long-term meditators self-induced high-amplitude gamma synchrony during mental practice. *Proc Natl Acad Sci USA* 101(46): 16369-16373.
 82. Salovey P, Mayer JD (1990) Emotional Intelligence: Imagination, Cognition, and Personality. *Science and Education* 9: 185-211.
 83. Goleman D (1998) *Working with Emotional Intelligence*. Bantum Books, USA. pp. 400.