MedCrave
Step into the World of Research

Journal of Psychology and Clinical Psychiatry

Review Article

Open Access

CrossMark

Mind in the brain - creation of the greatest virtual world

Abstract

Human mind is a functional capability of the brain, by which information about sensory-motor contacts made through the nervous system are perceived and interpreted by the mind. While the detection and interpretations are subjective and experiential, they are based purely on a cascade of neurocognitive processes that unfold in the brain in response to external events or sequential changes detected over time and space. Experiential or subjective interpretations are generally based on the selected choices, and often depend on the cognitive judgments made by the individual. The cognitive judgments mold the drive present in the individual and it is experienced as positive or negative emotions by the individual. Drive is the fuel or energy present in the system for all responses and actions related to "seeking", and they are automatically initiated when the drive reaches a Critical Level of Potentiation. It is possible for an individual to become aware of the presence of the drive as well as the process of initiation of actions in the attempt to satisfying the drive. Scientific observations of the changes that occur in the physical and social environment, which are normally detected by the sensory-motor systems, are repeatable and explain the time-space sequential relationships that exist in the physical universe. The major role of the mind is the experiential detection and interpretations of the sensory-motor events, which are experienced and expressed by the mental processes related to detection and expression. Subjective interpretations are generally based on personal experiences, which are highly suggestable and as per the needs experienced at personal and group levels by the individual minds. Individuals create goals and purposes for all actions, and in the process, the new functional systems of the mind are also created according to neuroscientific principles. The physical world shaped by the humans using science and technology for superior facilities are distinctly different from the functional world created for personal satisfaction, happiness, and as per their belief systems. One of the basic cognitive functions of human mind is to find meaningful associations among the elements within the universe in order to achieve the self-defined purposes of life in various ways. Mind is indeed the greatest natural apparatus, naturally evolved in the human brain and could develop signal generation and higher-order processing abilities. Ability to sequentially relate multi-modal signals across time and space, which help to make sensory-motor contacts with the inside and outside worlds, gives rise to cognitive functioning. Such processing in the brain produces concepts, thoughts, and communications, which may be essential for creating descriptive accounts of effective functioning in the living world. These cognitive functions helped to mold the motivational and emotional processes leading to advancements in civilization and culture. While scientific thinking considering relationships across space and time helped creation of new physical realities of innovations and technologies, functional systems help achieve higher levels of mental and social functioning.

Keywords: human mind, sensory-motor contacts, scientific relationships, sequential scientific relationships, cognitive judgments, experiential relationships, behavioral expressions, mental creation of positive and negative concepts of purposeful relationships

Volume 10 Issue 2 - 2019

Mukundan CR,[1] Kamarajan C,[2] Ajayan P[3]

[1]Axxonet Brain Research Laboratory, Axxonet System Technologies, Bangalore, India

[2]Henri Begleiter Neurodynamics Laboratory, SUNY Downstate Medical Center, USA

[3]Kingsboro Psychiatric Center, USA

Correspondence: Mukundan CR, Axxonet Brain Research Laboratory, Axxonet System Technologies, Bangalore, India, Email crmukundan@gmail.com

Received: April 9, 2019 | **Published:** April 15, 2019

Introduction

Human brain is the most complex machinery in the universe which facilitates the process of knowing the universe itself. Modern neuroscience conceptualizes that mind is the product of complex, dynamic interactions across brain regions enabled by large-scale brain networks.[1,2] Mind comprises of cognition and its effects on the drive as motivation and emotional effects of experiences and expressions. Psychological and neuroscience research literature explains drive mainly as emotional effects required for carrying out responses and actions. Drive has been considered from a religious point of view as the spiritual force required for one engage in all high-level activities which may include engagement in activities self-sacrifice for the welfare of other individuals or living beings. There is religious literature where drive is considered a higher level of force within the individual which is essential for the performance of all actions and responses. Only the outcome or the presence of the effects of drive could be observed, though drive itself remains only a psychological or spiritual fuel, as mere presence of energy within the body does not help induce actions in a person. Even a physically disabled person may make efforts to work, if he has the drive of the type that we are indicating, which would help him to carry on with actions even if they are painful. Human beings and their brain are the by-product of a long, sequential and hierarchical process of biological evolution, spanning millions of years in the arduous journey from simple organisms through complex species, and ultimately to the human race at the latest. The human brain and mind have been constantly involved in shaping the physical and social environment, while further getting shaped in the process by the civilization and culture created by the humans themselves.[3] Throughout this endless odyssey of human development, human drives (motivations, needs and desires), as molded by cognition (thoughts and ideas), have played a critical role to achieve the stage of "modern humans" who could make inventions and discoveries, build empires and institutions, create rules and laws, and cause miracles and wonders in all spheres of life. This paper discusses how complex interaction of drives with cognitive and affective processes shapes every aspect of human life either to achieve a positive outcome towards creativity and enlightenment or to end up in a negative outcome towards violence and destruction.

Cognitive processing effects on the drive

Sequential processing of signals across time and space within the brain help to understand scientific relationships to uncover laws of nature, and to function effectively in the physical and social environment, and we employ this knowledge for the creation of new physical realities. On the other hand, simultaneous processing of time-space changes across different time-space domains helped to conceptualize functional systems, which human brain could create

as the foundation of their physical and functional roles of existence across time and space. Cognitive processing carried out in the brain while determining the positive and negative effects of responses and actions executed also molds the drive, which the person who possess the drive may experience as positive or negative emotions. These emotions are generated, almost automatically, as an outcome of an individual's experiences and expressions. Emotions may arise while reacting to the cognitive judgments made about the behavior of other individuals as well as while emulating other individuals and their experiences.[4–24] Learning to control cognitive judgments and making objective decisions are indeed difficult tasks, which may require several years of learning and practice. On the other hand, following the examples of other individuals by learning to make cognitive judgments which would facilitate positive or negative emotions are easier (e.g., adopting the response style of parents or peers). Molding or modulating the drive or arousal to have a positive or negative outcome using cognitive judgment would need immense self-control. On the other hand, the process of directly learning to experience and express positive or negative emotions are indeed acquired easily through social conditioning, and using the cognitive judgments which may facilitate such social conditioning. Learning and mastering analysis of one's own thought processes and behavior, which may augment personal gains or mitigate losses, may be acquired through proper cognitive judgments and by molding one's own drive using such judgments. Although such practice may be extremely difficult and complex, one may acquire it through a rigorous practice of self-control, and intellectual contemplation and judgment. In fact, cognition and emotion modulate each other in reciprocal and complementary fashion.[25] Emotional experiences and expressions occur in reciprocal manner as soon as one makes a judgment about the behavior of other individuals when it is perceived to be relevant to the self or being affected by the behavior. Beneficial or retaliatory effects of the deeds of other individuals may be promptly supported by what one considers successful or adequate responses from the self. If the interpretations of the behavior of others are carried out with patience and only in self beneficial manner, the emotional effects may be created faster and with ease. The regulation of emotion also has a genetic basis,[26] and emotional dysregulation during development throughout childhood and later life can contribute to psychopathology and abnormal or suboptimal functioning.[27,28]

Positive and negative processing effects on drive

In general, positive emotions are happily accepted by individuals, often with a sense of achievement and related satisfaction. On the other hand, negative emotional experiences occur when one loses loved ones or material possessions. Sometimes, relationships with significant others may turn into distressing and painful experience, leading to discomfort, depression, personal loses and pain, and resulting in aggressive responses or fear, anxiety, shame, etc. The outcome of whether the drive gets molded positively or negatively based on the cognitive judgments made by the individual. Personal loses and gains in terms of interpersonal contacts, human relationships, and materials shape the memory and content of the mind with which decision-making and judgments are carried out, and this continuous, ongoing process constantly mold or modulate our drive state and response pattern. Each individual gets trained in such cognitive molding from infancy by parents, siblings, and friends who are part of the psychosocial world of the growing child. This experiential shaping of mind occurs in a natural manner, based on the values of life practiced by parents and other individuals who are intimately related to the growing child. As each one of us is exposed to experience from the physical and social environment and learn coping and response patterns from the same, and the development of emotional molding and the associated emotional experiences naturally occur in every growing child in a unique fashion. The art of cognitive molding of drive is not developed as a basic developmental requirement in most of the human societies, although the external and internalized social norms and values channelize this process during human development to the most extent. Various theories related to cognitive development as a product of one's interactions in physical and social world are considered universal.

Creative cognitive and affective effects

The life style and the actions that a man may indulge in executing are for the development and maintenance of a living system and life style, which they have initiated and developed. The intricacies and the contents of the life are designed by the individuals in different subsystems are for fulfilling the systems they have planned and created. It is true that the life systems of the animal world are by and large naturally evolved, and hence the animal or plant biological systems are primarily governed by the laws of nature. However, human beings who have the capability to create new ideas could develop variety of systems (as part of civilization and culture), which are in constant change with different goals of life in different time periods and geographical locations. They have realized that the system of life they have learnt to build and live are controlled by a force or drive, which is although constantly present and attended to, often extend beyond their normal or regular controlling needs. The biological drive is often conceived by many as a force beyond self-control, though optimal drive state is required for all types well organized responses and performance. As people could not scientifically or logically comprehend and manage such a conceptual complexity of drive-cognition-action-emotion interactions, they developed concepts of a supreme spiritual power responsible for the management of both physical and psychological management of the universe, which many considered the embodiment of love, compassion and truth. People differed in these belief systems, as many considered the so-called supreme entity to have absolute powers to control people and the universe. Some could semantically conceptualize different systems of "supreme power". At another level of thinking and feeling, we have people conceptualizing that a divine power was controlling love and affection, helping people keep away from evil forces. On the other hand, there are indeed group of individuals, who believe that those who do not agree with them and have difference of opinion about beliefs, loyalty, etc. must be annihilated. They indulge in violence and terrorism against those who do not agree with them. In contrast to these beliefs centered ideology, we are also able to think and deal with the universal forces as physical entities and also approach the world purely from rational and scientific points of view with love and affection. Physical intimacy dependent growth and existence strengthened closeness between two entities or living beings, which developed into emotional intimacy. The closeness strengthened into physical intimacy, affectional dependency, and love for the other being. The emotional intimacy has been detected even in plants and animals, which developed into affection and love in human beings. The need for physical intimacy is cognitively understandable to everyone, and such cognitive judgments reflect the need for intimacy or repulsiveness in each living being. The positive effect, such as love or compassion, not only influences the contents of cognitive processes, but also modulates the balance between complementary modes of cognitive control.[29] It should be noted that both cognitive and affective mental states emerge from the large-scale distributed

Citation: Mukundan CR, Kamarajan C, Ajayan P. Mind in the brain - creation of the greatest virtual world. *J Psychol Clin Psychiatry.* 2019;10(2):83–90. DOI: 10.15406/jpcpy.2019.10.00633

brain networks that sub serve and modulate these states.[30]

Response to cognitive judgments

The driving force within the living system, which could be used for the initiation and maintenance of actions and responses, may require skeletal-muscular powers and/or intellectual powers for maintaining and solving problems in different types of workloads. Finding solutions to critical intellectual problems, psychomotor solutions, etc. may often require sharing of the workloads by a team of experts. There may be only a few who may not make any attempt to identify the drive with any specific belief system, instead utilize the drive purely as a propelling force for achieving a relative merit in life. The enormous cognitive processing capabilities being enabled in the human brain have helped molding of the drive largely within the limits of one's own social and cultural milieu, which in turn shapes his/her personality and experiential effects and thought processes, which control the cognitive processes and judgments, causing building of diverse range of emotional experiences and expressions. There may be only very few who may be able to maintain their emotions without the influence of personal beliefs and needs, but for the majority of individuals emotions are always the outcome of and colored by personal convictions and motives. Similarly, individuals often develop a devotional relationship with a divine or spiritual force created by the individuals' own mind. This "spiritual force" eventually takes control of the mental faculties as well as response and actions, thereby controlling the whole life style of these individuals.[31] Individuals with "external" locus of control, tend to assume that their mental power works on the spiritual strength of their devotion to the "supreme power", and they completely surrender themselves to the ideology of a specific God or religion or principles which often tend to benefit other human and living beings and also foster coexistence and good will. Molding of the drive by devotional thoughts and practices would allow the person experience the drive secondary to the dominant motive of surrendering to the "supreme force", and thus would affect the entire personality, including cognitive functioning and actions in life. Some of the ancient traditions have encouraged individuals to learn complete self-control and not to get perturbed by situational demands and challenges or disturbed by their own needs or the lack thereof. This was practiced through a method called "Sthita Prajna", a higher-order mental state in which one would not automatically react to the emotional reactions of other individuals.[21] The qualities of "Sthita Prajna", as briefly narrated in Bhagavad-Gita, a Sanskrit scripture that is part of the great Indian epic Mahabharata, are:

1. Being desireless and satisfied in the self.
2. Maintaining stability in all situations.
3. Having emotional stability.
4. Having perfect self-control.
5. Being in the state of tranquillity.
6. Feeling fullness of the self.
7. Feeling oneness with the universe.

Consciousness, drive, and preattentive emotional response

What has been special about the understanding of drive is the presence of the internal force or urge to carry out actions seeking comfort and achievement or to avoid pain and suffering. Yet another term commonly used in the ancient times is "consciousness", which meant presence of life, awareness, and the capability for explorations, movements and behaviors. However, recent neuroscientific findings and scientific works have separated awareness as a distinct functional system of the brain. Awareness occurs when the listening brain monitors the talking brain during encoding and transcoding of signals generated from within or arriving from outside,[32,33] and verbal awareness is a state of knowledge initially produced and later tested by the brain. Consciousness was not considered necessarily propel the system into responses or actions, as done by the drive, though it is a state of readiness or vigilance while serving as a precondition for initiating or maintaining flow of sensation, perception or action. It was equally surprising when it was discovered that responses to external stimuli could occur without a conscious perception or awareness, as there is a non-conscious, preattentive, fast-track and efficient response system evolved for survival.[34–37] Scientific or rational thinking does not directly support any spiritual power, and science as created and practiced by humans has enabled technological marvels in all walks of life in the world. But science has not yet been able to directly support or induce a life force with "consciousness" in a machine, which could in turn develop such immense cognitive, sensory-motor capabilities, with such complex sensory-motor processing and emotive abilities like that of the human mind. Human mind is indeed the most complex system in the known universe. Human brain could be trained to experience sensations and also develop psychomotor effects through mere suggestions induced from outside or developed within (as it happens in hypnosis), and to carry on with functional changes beyond one's normal capabilities and physiological limits. Consciousness was considered a miraculous concept, similar to the drive which supported life in all living beings especially human beings. Within each human being, the drive works as the indispensable fuel for all types of sensory-motor and mental processing, which allow automatic responses as well as initiation and execution of planned actions. Responses to stimuli are known to occur through processing at the preattentive level itself,[34–36] even without perception and awareness the presence of a stimulus. This happens at the subcortical level as part of the perception-action cycle, which provides the seat for the triggering or activation of a drive system and drive-mediated direct responses (e.g., fight or flight). The subcortical areas have extensive network of connections with the cortical areas of the brain, which are known to allow mediation of neurocognitive processing associated with the initiation and controlled execution of actions.[38] Absence of drive or arousal does not allow initiation of any action or response from the body. We know that life may achieve meaning and need for expressions, but they can be initiated only in the presence of drive or arousal. It is nearly impossible to respond or initiate actions in the absence of adequate drive or arousal from within. We do also know that the several subsystems of the brain, especially the subcortical systems (i.e., limbic system and basal ganglia) and brainstem structures (i.e., pons and medulla) are needed for producing the behavioral effects of the drive that are deemed essential for life, as well as to induce the sensory-motor controls that are goal-oriented actions. Activation of specific cortical area is needed for the initiation and controlled execution of those actions. The involvement of frontal cortical areas in the initiation and planned execution of actions are already well established in several experimental and clinical lesion studies.[39] Drive originated and evolved in living organisms primarily as a survival mechanism, and has achieved its complexity in form and manifestations in higher animals (e.g., primates and humans) by a sequence of evolutionary processes. In humans, drive has constantly been molded and shaped by civilizations and social forces, largely due to "neurocognitive sophistication" that human race is endowed

Citation: Mukundan CR, Kamarajan C, Ajayan P. Mind in the brain - creation of the greatest virtual world. *J Psychol Clin Psychiatry.* 2019;10(2):83–90.
DOI: 10.15406/jpcpy.2019.10.00633

with and improving upon.[3] However, we do not have complete understanding about complex interactions of the drive system with other systems (e.g., perceptual/cognitive system, motor/action system, affective system, and other psycho-social motivational systems), especially in terms of what is achieved by mere presence of the drive in a living system, if it is not utilized for any response or action. On the other hand, we have already made devices/machine that use different fuels to generate movements and responses, which allow us to move around, and create new physical realities, etc. The physical realities which man has created would not have operated and become functional, without the controlled application of the fuel, whether in the form of oils, electrical energy, or solar energy, etc. The fuel/energy within the body allows it to functionally grow and interact with the surrounding environment and people around. The social systems created by man allow developing specific personal relationship with others, who get identified as parents, siblings, relatives, colleagues, and friends. There are also millions of other individuals who live on the same earth, with whom we share pleasantries as well as discomforts. They all use the same drive generated within the body system, created as a natural life product, though the fuel initiates independent actions and responses, which take each one to his or her specific goal in life at a time. The differences in drive among the people contribute to the differences in their performance and achievements at different stages in life. Although we have succeeded in exchanging or transplanting the body organs across individuals, we could never transfer the drive. Once the drive ceases to be available within the body system, rehabilitative support is sought for carrying essential movements and actions, provided the actions and movements are essential for the survival of the body system. We have succeeded in transplanting almost every body part, especially vital body parts, except the brain. We are not truly sure if the drive is controlled from this area alone, or if the drive has any other origin and some other components, other than the functional capability that we have observed in a living being. Millions of individuals were born and later died, and not a single one has ever come back to life, though several characteristic features have been genetically transferred to successive generations. These genetically or epigenetically inherited features can possibly include even life styles of individuals.

The drive and automatic initiation of premotor activity and the power of suggestions

The first important task that needs to find a proper answer or explanation is to know if the drive is primarily a physiological – biological initiating force or is it a psychological or psychobiological force that is used for initiating actions. It is important to examine what we consider the drive, which serves the psychological fuel to the system for the initiation and execution of actions. The psychological force that keeps the organism alive, active, and functioning has been often identified or described as a spiritual force. What one needs for initiating an action is the knowledge of the need for the action and preparedness for the initiation of the action and a response can voluntarily or automatically be initiated. The persistent strength of the drive and the planning capability of the individual could induce exciting changes in the working strategy of an individual, which can produce life-changing accomplishments. This is a regular achievement pattern seen across millions of individuals all over. A major personal feature of the drive underlying one's strength is the capacity of the individual to draw the best of professional skills and personal abilities, with high degree of cognitive molding of the drive to achieve emotional strength, all of which strengthen the drive and enable the individual to perform at the most efficient level and obtain the best results. This would require the supports from the parents, teachers, friends, whomsoever may play major roles in the life of the individual, as well as personal effort contributing to acquisition of skills, knowledge, and work dedication. The occurrence of phenomenon of preattentive emotional responses, which takes place without perception and awareness of the input signals, are already well established[34,35] and known to occur primarily for the biological survival needs of animals. Additionally, readiness to act has been already researched upon, and it is seen that an action is always initiated well before one becomes aware of starting the action. Pre-action state is facilitated by the presence of beginning of a readiness potential, which occurs without the awareness of the presence of the potential, though the individual may get ready to act. The potential has been called the Bereitschaftspotential. Even though the individual may not be aware of the beginning of the potential, the occurrence of potential which occurs well before the initiation of the action and indicates the readiness of the individual to make a specific response.[40–64] This "unbelievable" finding on preattentive brain activation suggesting that brain is "prepared" to act even before becoming aware of the future of the action, even before the "conscious mind" becomes aware of it created a worldwide discussion among the scientific community about the concept of "free will".[41] The readiness potential has to be initiated and reach a certain critical level of Potentiation for initiating a motor action in the motor cortex. If the potential does not reach a Critical Level of Potentiation,[65,66] the intended or desired action will not be initiated. On the other hand, an action may automatically be initiated when the drive is too strong, even if the intended action may not have been a socially approved one. A strong drive or desire for a movement or action may therefore automatically trigger the motor potential initiating the occurrence of the action, though the individual may later repent on entertaining such drive which triggered the action. Repentance in the presence of such high CLP during uncontrolled violent acts was revealed by many who were offered rehabilitative interviews and supports in prisons during their imprisonments for earlier violent engagements. If it reaches the CLP level, the specific action will be automatically initiated, well before the subject becomes aware of its occurrence. If the person does not want automatic initiation of an action to occur, the person must keep the pre-action potential or the drive at a low level, so that it does not reach the CLP level. In a simple button press paradigm, the negative potential starts almost 2-3 secs before a subject becomes aware that he is going to press the button. If the drive is high, it may reach the CLP level and the specific action would start without the awareness of the individual, though the individual always has the intention to make the response or action. Drive in this respect is a molded one, reflecting the desire or craving to carry out a specific act, which one may be desirous of carrying out, but would not normally either dare or have the courage to carry out as it may not bot a socially approved act. Interview with several prisoners, who were sentenced to severe punishments including death penalty have disclosed their repentance in carrying out the specific act for which they have been sentenced, and expressed the wish if they had adequate self-control to abstain from such act. The absence of self-control shown during such acts is what has been identified as absence of will power by many scientists while explaining the results of their neurocognitive studies, and by spiritual leaders. The ability to hold the drive under control is therefore an important practice one should acquire, which one generally acquires through social conditioning, the absence of which may throw one automatically

Citation: Mukundan CR, Kamarajan C, Ajayan P. Mind in the brain - creation of the greatest virtual world. *J Psychol Clin Psychiatry.* 2019;10(2):83–90. DOI: 10.15406/jpcpy.2019.10.00633

into antisocial activities. The increased drive which may propel or trigger a person into activity may essentially be caused by the meaning or personal interpretation and significance of an input signal rather than the input signals, The drive aroused may be as per the meaning or personal significance of an input signal rather than the strength of the input signals. This is easily demonstrated in the ERP experiments. Presentation of a signal half strong as an earlier experiment producing a much reduced P1 potential indicating a weaker sensory registration, induced a much stronger P3 potential, when the subjects have been suggested that they would be hearing a very powerful audio signal.[67–69] Similar effects have been earlier demonstrated by Gruzelier[70,71] and is a routine experimental demonstration with individuals. Significance of an input signal may easily be affected and the interpretation could be as per the meaning one assigns to the signal. Thus one may take serious action steps when one finds that something small or simple has happened, which one believed can turn into a grave incident in life. The responses and actions taken may then become in response to what one anticipates will happen later in life, rather than to the specific happening. This could become an important characteristic of the individual, which shapes his or her behaviour in all spheres of life. The skills one learns to control the drive and actions are always part of socialization and how the process formats the formation and functioning pattern of the mind of the individual. Suggestible individuals are those who have been endowed with or trained to have high suggestibility from childhood, who could easily accept ideas or concepts as suggested by others. Highly suggestible individuals display significantly increased amplitude of P300 event related potential representing recognition of a change, novelty effect, or familiarity etc., even when P1 potential may show inadequate sensory registration of a stimulus.[68,69] There is evidence of intense brain activation, with low signal strength, when the individual is suggested that he would receive a strong stimulus. On the other hand, a scientifically trained mind accepts such suggestions only if the same could be objectively proven and/or one could repeatedly make the same observations or repeatedly obtain the same findings. Human civilization shows dominance of presence of highly suggestible ideas and their acceptance in people as in the case of presence of a spiritual or divine force controlling the universe and lives of millions. Throughout human civilization, highly suggestible ideas by powerful people played a pivotal role not only in shaping the cultures but also in the origin and maintenance of religious ideas and practices as followed to this era by most people. There have been only a minority of people who professed scientific and rational mode of thinking based on scientific facts and logical ideas, although each individual has the choice to select a style of thinking and living.

Brain activation developed during recognition and conceptualization is indeed the product of the participation of the brain examining and detecting the multiple inputs into the system, which may need understanding and solutions. The sensory-motor effects or activation created in the brain depends on the level of processing that may be engaged during transcoding and encoding, and also monitoring of the verbal expressions, which produces verbal awareness of the verbalizations carried out during transcoding and encoding. These effects also serve as the additional core features of the experience of the individuals in whom the brain activation occurs. The experience of the virtual world, which the brain may create within, may often become equally or more important than the experience of the real world. Our life styles are shaped more by the experiences of the virtual world than that of the real world, and creation of the virtual experiences through thinking and imagination, which have become a necessity for creativity and innovations in all walks of human life.

Semantic creation of sensory-motor contacts and activities

The virtual world created within the brain and its ongoing dynamics in response to the real world phenomena represents the domain of 'mind' of each individual. The experience of the virtual world created within each brain is a subjective creation. These experiences and their semantic and symbolic interpretations mold the drive within and create emotional experiences. The mind is the psychological machinery that "operates" a human being using his/her body and the brain to function in the physical and social world. The semantic and symbolic creation of sequential and simultaneous relationships of components of the physical and social world, created through cognitive processing, and their effects molded on the drive as emotional experiences and expressions represented within and the body constitute the mind, and its activities in each individual. Every individual has the opportunity to build one's own mind and use the semantic and symbolic capabilities for creating own ideas as well as those made by others. Self-monitoring in the brain of the encoded and transcoded details of the sensory-motor contacts and possibilities provide verbal awareness of the same in each individual.[33,34] The molded drive becomes an immense experience for each, when they represent happiness, comfort, and pleasant sensory-motor experiences. The positive as well as negative emotional effects are behaviorally expressed by each organism. The inner world each brain creates semantically and symbolically represents the mind, which many continue believing as the representation of all components of the real world. It is indeed complex to understand how the brain creates the virtual world called the "mind" and lives in that virtual world accepting all values and critical issues which may or not have solutions.

Mental creations from sensory-motor contacts and experiences

Human mind is an extraordinary multimodal dictionary and processor, which continuously deals with enormous amount of time-space related sequential information as well as simultaneous/ongoing occurrences of events that may be contextually related to one's life-style and goals. In these complex, dynamic neurocognitive processes, each event is identified with a neural marker, its physical and functional relationships with spatially and temporally related other events are determined, and the cognitive frames of this multimodal information are encoded as explanations of the meanings of this sequential and purposive "chain of mental events". What each mind may semantically and symbolically create, and as colored by the molded emotional effects on the drive, provide each individual with either positive/cherishing or negative/painful meaning or experience. The experience of each individual may be unique, with such meanings and relationships, which another person may not necessarily experience with the same inputs. All experiences and expressions are encoded/transcoded in the brain, which may help create specific meanings with significances, although the subjective thoughts and ideas produced by the brain could purely be hypothetical or conceptual, with or without connections to the objective realities. Semantic descriptions and the meanings created, expected and predicted changes, and the drive molded with the emotional effects, could become the core formatting structure of the human mind. Scientifically thinking, we

Citation: Mukundan CR, Kamarajan C, Ajayan P. Mind in the brain - creation of the greatest virtual world. *J Psychol Clin Psychiatry.* 2019;10(2):83–90. DOI: 10.15406/jpcpy.2019.10.00633

already know about time and space related information processing is the fundamental operation, which are encoded and expressed, although there is no way to mentally conceptualize an absolute origin of the universe or any of its components, as the brain and the mind are derivative or the by-products of the forces within this vast universe. However, an individual could additionally create unique and unparallel model of functioning of entities in the universe and think in terms of absolute presence of the forces and components of the universe, as a cosmologist or theoretical physicist would theorize and express them. Strong personal needs often arise, as one may be influenced through indoctrination by the family, colleagues or society, to conceptualize and believe in the presence of a "supreme force", provided one is nurtured to believe in the presence of such force controlling all these components of the universe, including their own body and mind. Strong beliefs and suggestive thoughts could easily work on the mind and may partly on the body, changing or adjusting realities understood and recognized by the system. Individuals and societies have made use of this effect and formed a mental world as desired and believed by them for several centuries. True reality of the universe may never be understood by the brain-mind, but it has been possible to create new physical realities and also create knowledge systems convenient and comfortable for their existence and happiness. Accepting and believing in such a system may bring greater happiness and gratifications to human beings. Each individual may establish strong mental concepts and experiential relationship with the assumed "higher force" they believe and create in a centralized power, which one believes to control all actions and responses of all including that of the self. It is safe to assume that while the perceived and known physical universe is real, the concept and attribution of "supreme/higher force" is a psychological phenomenon created by the mind. On the other hand, the psychological or mental strength so created and acquired by the concept of "higher force" may work as a boon for many individuals, by deriving and utilizing part of that strength in all challenges, while this mental creation of the force and its attributions could also influence decision making and other mental functioning in many different ways, either for a positive, productive and creative functioning (i.e., universal peace, harmony, moral virtues, etc.) or for a negative, maladaptive and pathological functioning (i.e., superstition, violence, delusions, etc.). There have been individuals, who believe that they have acquired extraordinary mental power in their path of life, seeking and believing that they have access to divine experiences and strengths, and could later influence hundreds of others with their strong emotional mental capabilities either positively to lead a productive and transformative life or negatively to get involved in hatred, violence and extremism. These individuals assume that they have always conceptualized as well as created unique cognitive processing judgments beyond the physical limits of time and space. It is a popular conception among people that some of the mentally created capabilities and the relationships with each person are components of a spiritual world, considered dictated by divine forces. However, it is the brain that creates a virtual format of mind in each individual in every aspect of human life. Scientifically elucidating the ways to establish harmonious relationships among the components of the social world (i.e., among people, groups, and institutions) is indeed a difficult proposition at present, while it could be achieved by any individual only when one allows oneself towards attaining the state of "Sthita Prajna".[22]

Each individual life is for limited time periods, with his or her own mental values of life, and with specific goals in various spheres of activities of life. Each may have positively or negatively defined emotional relationship as per the cognitive judgments one makes, which give rise to a spectrum of emotionally molded life experiences. They are often continuously moving and changing their temporal and spatial relationships, though they learn to identify each specific domain by defining it at personal and group-social levels. Each person learns to make judgments identifying specific positive or negative role that may be created in life, though these roles may change while achieving personal goals. They learn to live sharing the comforts and difficulties with others, and work to enhance their life style individually and in groups by sharing responsibilities. On the other hand, there are also those who inflict pain and destruction to others, so that they could take away comforts and advantages in others' life, and they could insist on the need to believe and practice their own belief systems. The mentally defined properties and qualities may be merely imaginative and unreal, and beyond scientific inquiry; though they may be unique in offering different spectra of experiences in life, which human being alone could experience and live with. However, at the scientific methods of investigation, all these special meanings may lose their relevance, as each goal is subjective and meaningful only to the individual, although scientific understanding of the mind is attempting to explain the nature and origin of these "spiritual experiences" as it happens in the brain-mind.

There may indeed be huge differences in the virtual world formed in different human minds, by each person, which may make use of his/her unique neurocognitive resources, personal needs and personal priorities. This unique, personal experience is also due to the effects of cognitive judgments on one's drive, which is experienced and detected as emotional state/response of the individual. Mind could be conceptualized as a functional apparatus supported by the brain for the creation of both physical and artistic products. Scientific verification needs specialized studies and investigation methods, whereas artistic creations are essentially experiential and with expressive utilization. Scientific verification is not what one may look for in an artistic idea, whether it is spiritual or any other type. Scientific verification would essentially require multiple and repeated empirical verifications. Beauty, emotion, etc. are essentially the qualities of products or creations of the mind, which could facilitate human relationships, as well as expand abstract ideas, sense of beauty, happiness, and love, etc. All these are indeed extraordinary experiential qualities (called "qualia") which human mind alone could subjectively create, specialize and enjoy, all of which can render human life with a more enjoyable, personally sought out and beautiful experience. Science and art could indeed supplement each other to generate a meaningful and beautiful life. Both scientific thinking and artistic creations are human endeavors, which may be facilitated by encoded, transcoded and symbolic expressive methods of brain functions, which could provide the same with complex base for further expansions of ideas away from what could be scientifically explained or proven.

Acknowledgments

None.

Conflicts of interest

The authors declare that there is no conflict of interest.

References

1. Sporns O, Chialvo DR, Kaiser M, et al. Organization, development and function of complex brain networks. *Trends Cogn Sci*. 2004;8(9):418−425.

2. Barrett LF, Satpute AB. Large-scale brain networks in affective and social neuroscience: towards an integrative functional architecture of the brain. *Curr Opin Neurobiol*. 2013;23(3):361−372.

3. Henrich J. A Cultural Species: How Culture Drove Human Evolution: A Multi-Disciplinary Framework for Understanding Culture, Cognition and Behavior. Psychological Science Agenda. 2011.

4. Mukundan CR. Generation of Positive-Negative Emotional Experiences and Expressions through Cognitive Molding of Drive. *J Psychol Clin Psychiatry.* 2019;10(1):60–64.

5. Mukundan CR. Social Conditioning of Emotional Arousal for Facilitating Execution of Socially Accepted Responses & Actions. *Journal of Medical Practice & Review.* 2018;2(10):284−295.

6. Mukundan CR. Social Conditioning of Emotional Arousal – Psychosocial Need to Prevent Forensic Behavior, *J Forensic & Genetic Sciences*. 2018;2(2):111−116.

7. Mukundan CR. Understanding and Dealing with the Mental Creations: Living in Real and Virtual Worlds. *J Psychol Clin Psychiatry.* 2018;9(4):394−398.

8. Mukundan CR. Psychology from Neurobiology. *Psychology and Psychotherapy: Research Study*, Crimson Publishers. 2018;1(2):1−3.

9. Mukundan CR. Social Conditioning of Emotional Arousal for Facilitating Execution of Socially Accepted Responses & Actions. *Journal of Medical Practice & Review.* 2018;2(10):284-295.

10. Mukundan CR. Social Conditioning of Emotional Arousal – Psychosocial Need to Prevent Forensic Behavior, *J Forensic & Genetic Sciences*. 2018;2(2):1−6.

11. Mukundan CR. Understanding and Dealing with the Mental Creations: Living in Real and Virtual Worlds. *J Psychol Clin Psychiatry*. 2018;9(4):394−398.

12. Mukundan CR. Psychology from Neurobiology. *Psychology and Psychotherapy: Research Study*, Crimson Publishers. 2018;1(2):1−3.

13. Mukundan CR. On mind, memory and brain. *Indian Journal of Clinical Psychology*. 1997;24(2):103−112.

14. Mukundan CR. Emotion – The Driving Force, *Red Shine Publication*, Ahmedabad. 2017.

15. Mukundan CR. Emotion – Experience and Expressions. In: Jitendra Mohan, Meena Sehgal. Ideas of Excellence: Multiple Perspectives, Publication Bureau, Panjab University, Chandigarh;2016:166−194.

16. Mukundan CR. Brain to Mind-Integrating Scientific and Contemplative Approaches. In Proceedings of the Symposium on Integrating Scientific and Contemplative Approaches to Explore the Mind, jointly organized by NIMHANS, Bangalore and Garden of Samadhi Mind Centre on December 6, 2015, at NIMHANS, Bangalore, and published by NIMHANS;2016:112–123.

17. Mukundan CR. Neurocognitive Processing Steps during Remembrance. *J Psychol Clin Psychiatry*. 2016;6(6):1–4.

18. Mukundan CR. Assigning Meaning to Emotional Arousal. *International Journal of Indian Psychology*. 2016;3(4):6111−6133.

19. Mukundan CR. Emotional Experience and Expressions. *International Journal of Indian Psychology*. 2016;3(3):1−28.

20. Mukundan CR. Emotion – Arousal and Control. *International Journal of Indian Psychology*. 2016;3(2):1−20.

21. Mukundan CR, Arun Sasidharan, Priyanka Kacker. Sthita Prajna: A State to Control Cognitive Molding of Emotional Arousal. In: Jitendra Mohan, editor. *Emerging Contours of Excellence*. Publication Bureau, Punjab University;2017:24−40.

22. Mukundan CR, Kacker P. Arousal and Drive: Cognitively Molded Emotional Arousal. *EC Neurology*. 2018;11(1):12−20.

23. Mukundan CR, Kacker P. Molding emotion while cognitively processing physical & virtual realities. *EC Neurology*. 2018;10(5):354−366.

24. Mukundan CR, Kacker P. Emotional Arousal – the Driving Force of Life. *J Psychol Clin Psychiatry.* 2018;9(3):1−12.

25. Blair KS, Smith BW, Mitchell DGM et al. Modulation of emotion by cognition and cognition by emotion. *Neuroimage*. 2007;35(1):430−440.

26. Canli T, Ferri J, Duman EA. Genetics of emotion regulation. *Neuroscience*. 2009;164(1):43−54.

27. Cole PM, Michel MK, Teti LO. The development of emotion regulation and dysregulation: a clinical perspective. *Monogr Soc Res Child Dev*. 1994;59(2-3):73−100.

28. Carter AS, Briggs-Gowan MJ, Davis NO. Assessment of young children's social-emotional development and psychopathology: recent advances and recommendations for practice. *Journal of Child Psychology and Psychiatry and Allied Disciplines*. 2004;45(1):109−34.

29. Goschke T, Bolte A. Emotional modulation of control dilemmas: the role of positive affect, reward, and dopamine in cognitive stability and flexibility. *Neuropsychologia*. 2014;62:403-423.

30. Oosterwijk S, Lindquist KA, Anderson E. States of mind: emotio2ns, body feelings, and thoughts share distributed neural networks. *Neuroimage*. 2012;62(3):2110−2128.

31. Oakley DA, Halligan PW. Chasing the Rainbow: The Non-conscious Nature of Being. *Frontiers in Psychology*. 2012;62(3):2110−2128.

32. Mukundan CR. Power of Words: Neuro-cognitive Approach for Understanding Brain Mechanisms of Awareness. In: Sangeetha Menon MG, Narasimhan A Sinha, Sreekantan BV, Editors. *Scientific and Philosophical Studies on Consciousness*. National institute of Advanced Studies;1999;127−136.

33. Mukundan CR, Ajayan P. Awareness and Self-Image. *Indian Journal of Clinical Psychology*. 2011;38(1):1:37−48.

34. LeDoux J. Emotional networks and motor control: A fearful view. *Progress in Brain Research*. 1996;107:437−446.

35. LeDoux J. Fear and the brain: Where have we been, and where are we going? *Biol Psychiatry.* 1998;44(12):1229−1238.

36. LeDoux J. The emotional brain, fear, and the amygdala. *Cell Mol Neurobiol*. 2003;23(4−5):727−773.

37. Oakley DA, Halligan PW. Chasing the Rainbow: The Non-conscious Nature of Being. *Front Psychol*. 2017;8:1924.

38. Pessoa L. Understanding brain networks and brain organization. *Phys Life Rev*. 2014;11(3):400−435.

39. Fuster JM. The Profrontal Cortex: Anatomy, Physiology, and Neuropsychology, of the Frontal Lobe. 2nd ed. Raven Press, New York; 1989.

40. Deecke L, Kornhuber HH. An electrical sign of participation of the mesial supplementary motor cortex in human voluntary finger movement. *Brain Research*. 1987;159(2):473−476.

41. Deecke L, Eisinger H, Kornhuber HH. Comparison of Bereitschaftspotential, promotion positivity and motor potential preceding voluntary flexion and extension movements in man. *Progress in Brain Research.* 1980;54:171−176.

42. Deecke L. *Cerebral potentials related to voluntary actions: Parkinsonian and normal subjects*. In: Delwaide PJ, Agnoli A, editoss. Clinical Neurophysiology in Parkinsonism. Amsterdam and Oxford, Elsevier;1985:141(12):91−105.

Citation: Mukundan CR, Kamarajan C, Ajayan P. Mind in the brain - creation of the greatest virtual world. *J Psychol Clin Psychiatry.* 2019;10(2):83–90.
DOI: 10.15406/jpcpy.2019.10.00633

43. Deecke L. Bereitschaftspotential as an indicator of movement preparation in supplementary motor area and motor cortex. *Ciba Foundation Symposium*. 1987;132:231−250.

44. Deecke L. Electrophysiological correlates of movement initiation. *Review of Neurology*. 1990;10:612−619.

45. Deecke L, Kornhuber HH. Human freedom, reasoned will, and the brain. The Bereitschaftspotential story. In: Jahanshahi M, Hallett M, eds. The Bereitschaftspotential, movement-related cortical potentials. Kluwer Academic/Plenum Publishers;2003:283–320.

46. Shibasaki H, Barrett G, Halliday E, et al. Components of the movement related cortical potentials and their scalp topography. *Electroencephalography Clinical Neurophysiology*. 1980a;49(3-4):213−226.

47. Shibasaki H, Barrett G, Halliday E, et al. Cortical potentials following voluntary and passive finger movements. *Electroencephalography Clinical Neurophysiology*. 1980;50(3-4):201−213.

48. Shibasaki H, Barrett G, Halliday E, et al. Cortical potentials associated with voluntary foot movements in man. *Electroencephalography Clinical Neurophysiology.* 1981;52(6):507−516.

49. Shibasaki H, Sadato N, Lyshkow H, et al. Both primary motor cortex and supplementary motor area play an important role in complex finger movement. *Brain*. 1993;116(6):1387−1398.

50. Libet B. Unconscious cerebral initiative and the role of conscious will in voluntary action. *The Behavioral and Brain Sciences*. 1985;8:529-566.

51. Libet B. Do we have free will? *Journal of Consciousness Studies.* 1999;6(8-9):47−57.

52. Mukundan CR, Singh J, Ray R, et al. Bereitschaftspotential in alcoholics. *Biological Psychiatry.* 1986;21:1090−1092.

53. Khanna S, Mukundan CR, Channabasavanna SM. Bereitschaftspotential in melancholic depression. *Biological Psychiatry*. 1989;26(5):526−529.

54. Singh J, Knight RT. Frontal lobe contribution to voluntary movements in humans. Brain Research. 1990;29:531(1-2):45−54.

55. Ikeda A, Lüders HO, Burgess RC, et al. Movement-related potentials recorded from supplementary motor area and primary motor area: Role of supplementary motor area in voluntary movements. *Brain.* 1992;115(Pt 4):1017−1043.

56. Ikeda A, Lüders HO, Burgess RC, et al. Movement-related potentials associated with single and repetitive movements recorded from human supplementary motor area. *Electroencephalography Clinical Neurophysiology*. 1993;89:26977.

57. Ikeda A, Lüders HO, Shibasaki H, et al. Movement-related potentials associated with bilateral simultaneous and unilateral movement recorded from human supplementary motor area. *Electroencephalography Clinical Neurophysiology*. 1995;95(5):323−334.

58. Ikeda A, Shibasaki H, Nagamine T, et al. Dissociation between contingent negative variation and Bereitschaftspotential in a patient with cerebellar efferent lesion. *Electroencephalography Clinical Neurophysiology*. 1994;90(5):359−364.

59. Ikeda A, Taki W, Kunieda T, et al. Focal ictal direct current shifts in human epilepsy as studied by subdural and scalp recording. *Brain*. 1999;122(Pt 5):827−838.

60. Hamano T, Lüders HO, Ikeda A, et al. The cortical generators of the contingent negative variation in humans: A study with subdural electrodes. *Electroencephalogr Clin Neurophysiol*. 1997;104(3):257−268.

61. Sakai K, Hikosaka O, Takino R, et al. What and when: Parallel and convergent processing in motor control. *The Journal of Neuroscience*. 2000;20(7):2691−2700.

62. Picard N, Strick PL. Activation of the supplementary motor area (SMA) during performance of visually guided movements. *Cerebral Cortex*. 2003;13:977−986.

63. Soon CS, Brass M., Heinze HJ, et al. Unconscious determinants of free decisions in the human brain. *J Neurosci.* 2008;11(5):543−545.

64. Jahanshahi M, Hallett M. *The Bereitschaftspotential, movement-related cortical potentials*. Kluwer Academic/Plenum Publishers;2003;283−320.

65. Mukundan CR, Ajayan P, Kacker P, et al. Violent Behavior: Absence of Social Conditioning of Drives during Neurodevelopmental Stages. *International Journal of Indian Psychology.* 2014;2(1):1–33.

66. Mukundan CR. Brain Experience: Neuroexperiential Perspectives of Brain-Mind. New Delhi; *Atlantic Publishers*; 2007.

67. Mukundan CR, Ramachandra S, Singh S, et al. Brain mechanisms of hypnosis: P300 studies. *Indian Journal of Clinical Psychology*. 1999;26(1):13−23.

68. Mukundan CR, Kamarajan C, Ajayan P, et al. Frontal Cortex and Recognition: Neurocognitive Findings of Hypnosis. *Indian Journal of Health & Welfare.* 2013;4:703–710.

69. Mukundan CR. *Brain at Work: Neuroexperiential Perspectives*. New Delhi: Atlantic Publishers;2015:1−504.

70. Gruzelier, JH. Frontal functions, connectivity and Neural Efficiency Underpinning Hypnosis and Hypnotic Susceptibility. *Contemporary Hypnosis.* 2006;23(1):15−32.

71. Gruzelier JH. Redefining hypnosis: theory, methods and integration. *Contemporary Hypnosis.* 2000;17(2):51−70.

Citation: Mukundan CR, Kamarajan C, Ajayan P. Mind in the brain - creation of the greatest virtual world. *J Psychol Clin Psychiatry.* 2019;10(2):83–90.
DOI: 10.15406/jpcpy.2019.10.00633