**Concept of *Guna* in Indian Philosophical Systems: A Cognitive Science Perspective**

**Dr. V.Ramabrahmam**

**Associate Professor of Physics (Retired)**

**K.M. Centre for P.G. Studies**

**H.No. 27-10-6, Near Subbarayudu Temple**

**Sriramapuram, Bhimavaram – 534202**

**India**

**Abstract**

Indian spiritual and philosophical systems are essentially cognitive scientific in nature. Having origin in the Upanishads all Indian philosophical systems supplemented and complemented one another to develop a comprehensive source book of cognitive science. The nature and form of consciousness, mind and its functions are extensively dealt with and discussed from Upanishads through Buddhism, Jainism, *Viseshaka, Nyaya, Yoga, Samkhya, Poorva Meemamsa,*and *Uttara Meemaams, Sabdabrahma Siddhanta*  contributing to many concepts which have relevance to cognitive science and language acquisition and communication. In this paper all these will be reviewed and especially the concept of *guṇa* as envisaged in various Indian philosophical systems will be presented and correlated. The evolution of concept of *guṇa* through *Shaddrarsanas* will be specifically looked at. A correlation with *Sabdabrahma Siddhānta* of Indian grammarians initiated by *Patanjali* and developed through *Bhartruhari* will also be presented.

Key-words: *guṇa*; Upanishads; *Shaddarsanas;* Buddhism; Jainism, *Sabdabrahma Siddhanta*; cognitive science; Indian grammarians

Paper presentation at 13th International Conference of The World Association for Vedic Studies “Vedic Traditions for Education & Learning” at Dallas\*, Texas, USA (\*Venue TBD by 2nd Announcement) August 3 to 6, 2018

**Introduction:**

Cognitive science is the interdisciplinary study of how information is represented and transformed in the brain. Cognitive science consists of multiple research disciplines, including psychology, artificial intelligence, philosophy, neuroscience, learning sciences, linguistics, anthropology, sociology and education. It spans many levels of analysis, from low-level learning and decision mechanisms to high-level logic and planning; from neural circuitry to modular brain organization.

Cognitive sciences often rediscover the philosophical analyses painstakingly. A better policy to understand and model human consciousness and mental functions would be; first to learn what philosophy (Eastern and or Western) teaches us about human consciousness and mind in this regard, and then move on to experimentation and model–building within the scope of positive sciences. The information available in Indian spiritual and philosophical systems when correlated from cognitive science point of view; this Indian philosophical insight will be useful to understand and model the form, structure and functions of human consciousness and mind; and to provide as well necessary hints to software and also hardware which would model the tasks of mind.

Human consciousness, mind and their functions are deeply and widely dealt with by Indian spiritual and philosophical systems. As many think, Indian spiritual and philosophical systems do not solely or one can say not at all deal with theology but with cognitive science – human psychological and cognitive and communication aspects. Theological interpretations of *Bhakti* schools of thought are more personalized interpretations of the Upanishads and neither represent nor translate the spirit of the Upanishads and related spiritual and philosophical systems and associated commentaries. This does not mean to say theological schools of thought have misinterpreted. But they used cleverly to develop their own *Bhakti* schools of thought making use of *Prasthaana Traya*, consisting of the Upanishads, the *Brahmasutras* and the *Bhagawadgita*.

Traditionally Indian philosophical systems are classified as Orthodox and Un-orthodox (heterodox) systems. Orthodox systems are the ones which believe in the Vedic instructions and accept the authority of the Vedas. The Upanishads, the *Sabdabrahma Siddhanta / Sphotavaada, Advaita* and *Dvaita* schools of thought and the *Shaddarshanas* together with the commentaries on them through generations are orthodox Indian philosophical systems.

Unorthodox or heterodox systems do not believe in the Vedic instructions and do not accept the authority of the Vedas. The Buddhism, the Jainism, the *Chaarvaaka* school of thought, and later rational schools influenced by these and also the Western rational philosophical expressions constitute heterodox systems. The Buddhism and the Jainism have been influenced by the Upanishads and in turn have also been useful as basis together with the Upanishads for the evolution and development of later orthodox systems like the *Shaddarshanas – Nyaaya, Vaisheshika, Saamkhya, Yoga, Poorva Meemaamsa and Uttara Meemaamsa or* Vedanta. This paper makes use of the orthodox systems and also gets the benefit of both orthodox and unorthodox systems in the understanding and development of cognitive science perspective of Indian philosophical systems by supplementing and complementing their contents chiefly sourcing information from the *Brahmajnaana* or *Atmajnaana* or Knowledge of the Self as is popularly known [3-7].

Ancient Indian wisdom as revealed in the *Upaniṣads*, has a lot to say about human consciousness Ramabrahmam [3-6]. The expressions of the *Upaniṣads*, popularly known as *Brahmajnāna*, when translated into the modern scientific terms will benefit the fields of physiological psychology; the natural language comprehension branch of artificial intelligence, and the modelling of human cognition, language communication and understanding processes. The Buddhism, Jainism and later *shaddarsanas* together with *Brahmajnaana* have evolved complementing and supplementing one another and a broad insight of human consciousness, mind and its functions, cognition and communication processes of mind in relation to worldly knowledge including – social, scientific disciplines, philosophy, fine-arts and all kinds of skills - like sculpting, driving, carpentry. Masonry, - and spiritual knowledge.

*Ṣaddarśanas* (*Nyāya, Vaiś****e****ṣika, Sāmkhya, Yoga, Poorva Mīmāmsa,* and *Uttara Mīmāmsa* or Ved*ā*nta) are distilled expressions of the Upanishads, the texts of Buddhism, the texts of Jainism and related ancient Indian spiritual and philosophical texts. And are evolutionary products in nature, in advancing, and improving, substantiating, opposing, inducting, deducting contemplating over earlier texts and are codifiers of Indian philosophical essence having implications and applications to cognitive science.

*Nyāya* provides rules for valid and agreed to means of cognition. *Vaiś****e****ṣika* gives idea about the construction and constitution of cognition, description of cognition elements in terms of minute parts (*aṇu*). *Sāmkhya* provides identification of constituent elements of cognition, instruments cognition, types of cognition. Yoga provides understanding of cognition process and stalling and or control of cognition process. *Poorva Mīmāmsa* discusses about cognition process and language acquisition and communication theories

Cognition of objects is temporary. Atman is the constituent cause (*samavaayi kaaraṇa*). And contact of atman with *manas* is the auxiliary cause (*asamavayi karaṇa*). The soul (Self) brings about cognitions when it is contact with *manas.*

Ved*ā*nta or *Uttara Mīmāmsa* gives more comprehensive treatment of cognizing and cognized elements, instruments of cognition, phases or conscious states of mind, seven cognitive states, five functional states during which various cognitions and cognition-created and related happenings. *Vyākaraṇa*, gives idea of process of language acquisition and communication.

This paper makes use of Vedanta, *advaita* philosophy and *Śabdabrahma Siddhānta*; (*Sphota Vāda*) essentially and sources from *Śaddarsanas* and other related texts from all Indian traditions and schools of thought – spiritual as well philosophical.

Ramabrahmam [3-7] has delineated *Upaniṣadic* insight and presented human consciousness as a physical entity and as non-dual (a*dvaita*) awareness representing and being the original or normal or natural or ground state of human mind as pure consciousness. Then the experience is bliss/peace/silence and self-consciousness is absorbed or got absorbed in pure consciousness. Consciousness is also experience when no cognitions or cognition-related experiences are in the awareness of mind. Experienced awareness is consciousness. Awareness of nothing within or without the body is consciousness. It is peace, bliss and silence. Mind is dual *(dvaita*) awareness. Knowing, perception, thinking, doing intellectual operations, discrimination, feelings, having moods, urges, intuitions, understanding, getting and having insight, experiences are functions of mind reflected as cognitions and communications through sense organs and action organs respectively in the four consciousness states of mind.

**Cognitive scientific insight of *Padaartha*: The Upanishads, *Brahmajnaana* and other philosophical systems [5]:**

All Indian spiritual and philosophical schools of thought have proposed the energy / matter responsible for cognition / communication and as well the various aspects of cognition such as cognizing element / agent / subject, instruments of cognition, object of cognition, validity of cognition etc., (Ramabrahmam 2013a, 2016, i.e., both hardware and software). Even though different schools used different technical terms for these, the essence is same and all these schools supplemented and complemented one another to provide a comprehensive idea about human consciousness, mind - their functions, and axioms and scheme of human cognition and communication together with process of human language acquisition and communication; which present day cognitive scientists can use profusely.

***Sloka:***

*Naama roopa vinirmuktam yasmin samtisthate jagat*

*Tam aahuhu prakrutim kechin maayaam anye paretva cha anoon*

**Meaning:**

The substance / energy in which all the mental phenomenal world sans name and form lies prior and later to mental functions (which is primary and primordial to the formation of mind and medium for its functions), is called by some as *prakruti* by some others as *maayaa* and by still some others as *anoon* (Radhakrishnan, 1993).

**Explanation:**

The substance / energy which holds and is contained in all the mental phenomena is called by some as *prakruti* (by *yoga- saamkhya* systems), by some other as *maayaa* (by *Vedaanta* – *uttara meemaamsa / poorva meemaamsa / advaita* systems) and by still some others as *anoon* ( by *nyaaya-vaiseshika* systems).

Thus the various schools of thought call the same substance which is responsible for human consciousness and mental functions as *prakruti, maayaa* or *anoon* and cognitive/communicative process is developed and described by all of them in their own way. Thus *padaartha* comes under both the hardware / software part of human mental processes, undergoing transformation during various mental processes and mental phases into various mental functions as hardware and deciding the validity of knowledge, cognition and communication by working as software simultaneously and reverts to its original form as *prakruti / maaya / anoon*, when mental functions cease to happen thus also causing various conscious states or phases of mind (Ramabrahmam, 2016).

*Nyaya* provides rules for valid and agreed to means of cognition.

*Vaiseshika* gives idea about the construction and constitution of cognition, description of cognition elements in terms of minute parts (*anu*).

*Samkhya* provides identification of constituent elements of cognition, instruments cognition, types of cognition.

Yoga provides understanding of cognition process and stalling and or control of cognition process.

*Poorva Meemaamsa* discusses about cognition process and language acquisition and communication theories.

Vedanta or *uttara meemasa* gives more comprehensive treatment of cognizing and cognized elements, instruments of cognition, phases or conscious states of mind (Upanishads), seven cognitive states (*Gayatri Mantra*), five functional states (*Vedanta Panchadasi*) during which various cognitions and cognition-created and related happenings.

*Vyakarana* gives idea of process of language acquisition and communication. As said, this paper makes use of *Brahmajnaana* available in the Upanishads,Vedanta, *advaita* and *dvaita* philosophies and *Sabdabrahma Siddhanta* (*Sphota Vada*) essentially and sources from *Saddarsanas* and other related texts from all Indian traditions and schools of thought – spiritual as well philosophical [8].

Ramabrahmam (3-7), has delineated *Upanishadic* insight and presented human consciousness as a physical entity and as non-dual (a*dvaita*) awareness representing and being the original or normal or natural or ground state of human mind as pure consciousness. Then the experience is bliss/peace/silence and self-consciousness is absorbed or got absorbed in pure consciousness. Consciousness is also experience when no cognitions or cognition-related experiences are in the awareness of mind. Experienced awareness is consciousness. Awareness of nothing within or without the body is consciousness. It is peace, bliss and silence. Mind is dual *(dvaita*) awareness. Knowing, perception, thinking, doing intellectual operations, discrimination, feelings, having moods, urges, intuitions, understanding, getting and having insight, experiences are functions of mind reflected as cognitions and communications through sense organs and action organs respectively in the four consciousness states of mind.

***Brahmajnaana*:**

Human cognition takes place sequentially in stages and human communication takes place sequentially in the reverse order under the observation of human consciousness. Consciousness acts as non-transforming awareness - untouched, uninvolved seer, witness or observer - being present through the series and sequence of cognition and communication, playing the dual role of material cause (*upaadaana kaarana*) and instrumental cause (*nimittakaarana*). This is technically called *padaartha* by the Upanishads, meaning that consciousness – the result of breathing process – is the source of energy / matter by / with which the cognition is made up of and carried through. Upanishads use the term *Brahmapadaartha* to signify, quantitatively and qualitatively*, aatma sakti* – psychic energy -energy issued out from the *Aatman*, generated to create various phases of mind or conscious states of mind, which provide consciousness and in which mental functions are conducted and also mind ceases to function mentally.

*Naama bhaava vaasanaa rahita vastu padaarthaha* *iti*, ***Brahmapadaartha*** (Upanishads / *Brahmajnaana*).

This means – *Brahmapadaartha* is one which exists sans transformations as name (*naama*), feelings / thoughts (*bhaava*), remembrance / experience / memory (*vaasana*). *Brahmapadaatha* gives rise to *Aatmasakti* or *chit sakti*.

*Vaisheshika, nyaya, saamkhya, yoga* and *vyaakarana* also proposed cognition elements / medium as *padaartha* as follows:

***Vaishesheka*:**

This technical term *padaartha* is also used by *Vaisheshika* School of *Shaddarshanas*, and says:

*Dravya-guna-karma-saamaanya-visesha-samavaayaaha* - *padaarthaa****s*** (6) [*Vaisesika* – argues for the existence of the self for bodily functions / activities]. *Abhaava* is added later.

And *Sakti* (potentiality)-*asakti* (non-potentiality)-*saamaanya visesha* (commonness) – *abhaava* (non-existence / no-cognition) are added later. [Substance has quality and action].

*Prithivi-appaha-tejaha-vaayu-aakaasa-dik-kaala-mana-aatmaa* *– iti* ***dravyaani.***

***Nyaaya*:**

*Pramaanaihi artha pareekshanam nyayaha* ***–*** To examine the meanings of spiritual and philosophical expressions through *pramaanas* (means of knowledge) and arrive at and establish the validity of truth is *nyaaya*. These same *pramaanaas* validate future acquisitions of secular, philosophical, spiritual knowledge.

*Pramaana* (means of knowledge)- *prameya* (the objects of knowledge)- *samsaya* (doubt)- *prayojana* (purpose/use)- *dristaanta* (syllogism/examples)- *siddhaanta* (accepted truth)- *avyaya* (members of syllogism)- *tarka* (indirect proof)- *nirnaya* (determination of the truth)- *vaada* (discussion)- *jalpa* (wrangling)- *vitanda* (cavil or destructive criticism)- *heetvaabhaasaa* (fallacious reasons)- *chala* (quibbling)- *jaati* (futile objections)- *nigraha sthaana* (occasions for reproof) – The first nine are more strictly logical than last seven (which have the negative function of preventing erroneous knowledge). The last seven are more weapons for destroying of error than the building of truth.

**Four Kinds of valid knowledge**: *Patyaksha* (Perception)- *lyingika* (inference)- *smriti* (remembrance / memory)- *aarsha jnaana* (intuitive knowledge/confirmed by earlier scholars) - [*Nyaaya* - says*Self is the basis of mental phenomenon*]. Thus *nyaaya* mostly deals with the software of human cognition and communication.

As can be envisaged the term “*padaartha*” constitutes the software of mental functions in the *nyaaya* school of thought..

***Samkhya and Yoga*:**

*Saamkhya* – 24 – *taanmaatraas* –objective energy forms – 5; sense organs (*jnaanendriyas*) – 5; communication / action / reaction organs (*karmendriyas*) – 5; kinds of action by action organs- 5; *antahakaranas* – inner mental tools – 4 = 24

*Pratyaksha, anumaana, aagamaaha pramaanaaha (Yoga Sutras)* – knowing through sense organs *(pratyaksha*), inference (*anumaana*) and authority of earlier intellectuals and scholars (*aagama*) are means of knowledge and they determine the validity of knowledge too.

Thus mind is divided into 24 parts each having its own function and also the means and ways to gain knowledge and determine the validity of knowledge too and also communicate.

***Poorva Meemamsa*:**

Cognition of objects is temporary. *Aatman* is the constituent cause (*samavaayikaarana*). And contact of *atman* with *manas* is the auxiliary cause (*asamavayeikarana*).

The soul (Self) brings about cognitions when it is contact with *manas*.

***Uttara meemsa* or Vedanta:**

Vedaanta – 25; the above 24 proposed by *Saamkhya* and Consciousness/awareness = 25;

***Vyaakarana* – *Sabdabrahma Siddhanta / sphota vaada*:**

*jaati, guna, kriya, yadruchcha* = 4

Thus all these terms are only cited and not explained fully as all are technically and essence-wise are essentially same.

In all these systems, *padaartha* thus is defined and termed as*raw “material” / energy* constituting the consciousness/awareness, mind, cognition/communication, the instruments of cognition/communication, objects of cognition/communication, phases of mind in which cognition/communication takes place or not, functional / cognitive/communication states of mind, the tie-ups of mind with object-energy forms, storing and retrieving inner mental world through instruments of cognition/communication; [moods/senses/experiences/meanings/senses/ - feelings/thoughts/logic/sentence- utterance in expresser/teacher and in reverse order in the listener and vice versa].

The construction, structure, storing/retrieval of cognition/communication are modelled only from *Brahmajnaana* point of view using *advaita* and *dvaita* concepts of mind and its functions and also using relevant information available in various above-mentioned spiritual and philosophical texts; correlating with brain wave modulation/demodulation of mental energy waves. The current of awareness is also proposed using these concepts, which underlies all cognitions/communications and its reversible being creates, sustains and dissolves cognitions/communications

**Scheme of human mental acquisitions, functions and communications according to Upanishads:**

While mind is functioning, there will be a differentiated perception of *knower-knowing-known* or *subject-verb-object*, which will be missing and absent when non-dual (*advaita*) awareness or pure consciousness becomes unoccupied awareness Ramabrahmam [3-7]. Experiencing or understanding or getting insight of verb is state of experience and then *knower-known* or *subject-object* are not attached to the verb. Verb will be in a present continuous form or infinite form depending on it is absorption of information or understanding cognition or experiencing cognition or urge (to express or do) or intuition (result of perception or instinct took form or genetic knowledge expressed through hormones or like them) or sense or meanings of utterances received or to be expressed [7].

We knowingly or unknowingly alternate between non-dual *(advaita*) and dual (*dvaita*) awareness while functioning mentally. Wakeful and dream conscious states of mind represent and account for the phase of mind when functioning and then we also are aware of and sense or perceive self-consciousness. Once mind ceases to function, we experience peace, bliss and silence within. If these are experienced our being aware them, the phase of mind then is known as wakeful sleep. If we are unaware, but are conscious of these, the phase of mind then is known as deep sleep. The phase of cessation of mental functions (also self-consciousness) is similar to zero in number system and vacuum in physical and biological sciences. Vacuum is inherent in matter and holds matter and is manifested when matter is missing or absent. Consciousness is awareness of mind when no mental functions are taking place. This idea is further elaborated below [3, 4].

Simply put, according to *Upanishads*, human mental functions are the forward and backward transformations of *chidābhāsā* or *māyā or praṇavam* - the carrier (in the sense of carrier radio wave in broadcasting and reception process) cognitive-energy pulse series, *modulated*by energies sensed through sense organs or the stored information as potential energies retrieved (as *vasanas* - object-experiences, which include meanings of utterances, first and then *jagat* [inner world] as feelings/thoughts/perceptions) and *demodulated* to give humans knowledge, experiences etc.The transformation of *māya*, reverse transformation of *māya* and cessation of transformation of *māya* - the *dvaita* and *advaita* conscious states respectively- taking place simultaneously, consecutively and alternately is the structure, form, function, state and essence of human consciousness, mental functions and cognitive processes [8]Most of present attempts aim at modeling machine cognition as an isolated process which is the result of sensing19. But if human mental processes are observed, it becomes obvious that human perception is but an intermediary process which transfers sensing into sense (understanding/experience) and sense into expression. Human cognitive process can be stated sequentially as follows: (1) *sensing:* through sense organs (knowing), (2) *perception* (thinking, reasoning, decision making, etc.,), (3) *understanding/experience*, (4) *purport*- meaningful experience or experienced meaning. Human mental process is generally held to be a combination and quick successive transformations of four modes i.e.,

**I Speaker/Teacher:** (a) Purport/Awareness (Meaningful Experience or Experienced Meaning (b) Understanding/Experience (c) Perception/Thinking (d) Utterance /Expression

**II Knower/Listener/Learner:** (a) Knowing (through sense organs) (b) Perception/Thinking (c) Understanding/Experience (d) Purport (Meaningful Experience/Experienced Meaning)/Awareness.

Four conscious states of mind, which are phases, cognitive and functional states of mind and seven cognitive states of mind: (*Sapta Lokās*) Ramabrahmam [2006] and four modes of language acquisition and communication are available (Concept Diagrams I to V). These ideas are further advanced as follows.

**Cognitive scientific meaning of *Guna* and Cognition insight:**

The word *guṇa* extensively used in Indian spiritual texts, means mental tie-up. Th vaiseshika, samkhya, yoga and Vedanta extensively discuss the concept of *guna.*

If the mental tie-up is with object-energy form through the means of *manas*, it is ***tamo guṇa****; bahirmukha driṣti; antarmukha driṣti* too.

If the mental tie-up is with inner mental world –with stored collection of information about outer physical and/ or impressions created by such information it is ***rajo guṇa****. Antarmukha driṣti*

If the mental tie-up is with experience, mood, meaning, sense, insight, understanding, intuition, urge, volition, through inner mental tool *chittam,* it *is* ***sattva guṇa****. Antarmukha driṣti*

If no mental tie-up is there with objective-energy forms or objected-energy created experiences / insight / ideas / sense / meaning it is called ***nirguna*** state of mind.

It is not the question of whether an object is there or not in physical world around. It is whether the object is cognized or not. When *chit* energy lights the object, the object is cognized. If the light is off object is not cognized.

When not cognized for the lack or absence of *chit* energy it is as good as the object is not present for the cognizing agent. Lighting of object world (outside the body or perceived within the body from earlier already created mental impressions) is cognition by *chit* energy. The object is present as stimuli-causing in the outside physical world and as potential energy form inside the body as perceived world or between chit energy or object-energy form (live, dynamic, current). Lighting by *chit* energy means presence of mind to be able to do all forms mental functions. Absence of mind is deep sleep or wakeful sleep conscious state.

**Process of Cognition and Communication - Axioms:**

Cognition is a series of cognition and re-cognition and communication.

Cognition and communication – Listener and Expresser:

Cognition consists of cognizing elements, cognizing tools, cognizing agent, cognizing process, cognized elements: Knowing – perceiving – experiencing / Understanding/ Becoming the Sense and being the essence / fruit / purport / import / rasa / culminating as peace / bliss / silence (No – cognition state but is the result of experience of the essence of the cognition) – in the listener and just the reverse process in the expresser forming and resulting in the communication.

**Software:**

**Human beings know by the following means (*pramāṇās*):**

The means of cognition are: (Software):

1. Through sense organs: *Pratyakṣa pramāṇa*

Sense organs: receiving information

Knowing takes place through the medium of inner mental tool – *manas* –

1. through inference: *Anumāna pramāṇa*

through the inner mental tools – *manas, buddhi* (discrimination and intellectual operations, ahamkaaram (formation and collection of thoughts/feelings about the individual in attention to body gender, mental traits, social status, and the like) and *chittam* ( collects, receives, creates, stores, retrieves, recollects object-energy created experiences simultaneous to and in tune with knowing and perceiving – which includes the meanings, senses, understanding, insight, mood, intuition, urge, physical and psychological cravings etc.,)Inner mental tools: registering and reproduction of information

1. by authenticity, authority or through faith, allegiance and obedience to earlier expressions of eminent intellectuals: *śabda pramāṇa*

Completely based on faith the individual has for experts in the field, instinct, earlier knowledge brought down through generations through books etc.,

Thus cognition has three stages of knowing, perceiving and experiencing and all these three under the observation of the Consciousness as acts as Seer / Witness untouched by these mental happenings during the whole process of cognition, re-cognition and communication.

There is also a state or stage of no-cognition taking place, then the consciousness is pure known as pure consciousness, signifying content-free contented state, cognition and related experiences-free unoccupied awareness – experienced as bliss, peace silence, mental quietude, anxiety-, fear-, worry-, doubt-free mental state.

Action organs communicate and express the already mentally stored, recollected, re-cognized experience, perception.

**The Formation and Structure of cognition and communication:**

**Concept and idea of Triad (*Triputi*):**

**The Triad**:

The cognition- knowing, perception, storing, re-cognition, retrieval and communication are facilitated by the psychic energy released by breathing process and its transformation and transductions in forward and reverse directions.

The transformation in forward and reverse direction of reflected psychic or mental energy gives rise to *dvaita* state of mind when consciousness becomes seer + awareness and splits into triad as knower – knowing – known; subject – verb – object; cognizer – cognizing – cognized; communicator – communicating – communicated during cognition and communication of humans.

When this transformation and reverse transformation cease to take place then the state of mind is known as *advaita* state, when knower and known merges into knowing; subject and object merges into verb, cognizer and cognized into cognizing, communicator and communicated starts as communication. Thus the cognition consists of**:**

**Structure of Cognition:**

Cognizing element/agent/subject Instruments of cognition object of cognition

(impersonal)

*Dvaita* phase of mind:

Conscious states of phases of mind when mind alternates between *dvaita* and *advaita* states during wakeful and dream conscious state of mind

Mental states of cognition: *Advaita, dvaita* and their simultaneous existence and working

Types of cognition: Knowing, perception, experience / mood/sense/ meaning/ understanding/ insight/intuition/ urge, craving:

Stages of cognition:

States of cognition:

Functional – form – construction – structure – plane – level of cognition

Elements of cognition: Object energy forms (sense organs / knowing), electro-chemical (inner mental tools / perception / logic / intellectual operations /) and biochemical [experience / sense / mood etc., (inner mental tool *chittam*)] under the observation of infrasonic oscillator – the consciousness.

Forms of energies being sensed during knowing: light (eye); sound (ear); chemical (tongue - taste / nose – smell) mechanical (skin – touch) heat (skin - cold, cool, warm, hot).

Form of energy facilitating perception and other intellectual operations, sentence formations: electro-chemical.

Form of energy facilitating experience etc.,: biochemical

The perception (electro-chemical) and experience (biochemical) are carried by and as the frequency modulations/demodulations of the infrasonic pulse series – the reflected mental energy pulses – the brain waves – generated by and are the result of rhythmic breathing process. (Ramabrahmam, 2009-a, -b,- c)

*Prapancham* is created as potential energy in the respect cortices and when this is retrieved, it is called *jagat*, the dynamical form of information as thought, feeling, perception preceded by experience, mood, sense etc., differentiated and split as knower-knowing-known or subject-verb-object, the triad, in the *dvaita* phase of mind i.e, the *jāgrat* (wakeful) and *swapna* (dream) conscious states of mind.

**Instruments of Communication:**

Inner mental tools: retrieval and reproduction of information through action organs

Action organs: reaction and responding to information.

**Conclusions:**

**Human Mind: Its phases, cognitive states, functional states and functioning as *gunas*:**

Human mind has four modes or ***gunas*** - mental ties-up - of functioning.

Three modes of awareness in continuous consciousness: ***tamo-, rajo-, and sattva gunas.***

Mode of knowing/expression – in this mode objective-energy form is received through sense organs and communicated through action organs. This is ***tamo guna*** state of mind.

Mode of perception, communication, sentence, logic, reasoning etc., This is ***rajo guna*** state of mind.

Mode of insight, understanding, experience, mood, meaning, sense, intuition, instinct, urge, common sense etc., This is ***sattva guna*** state of mind.

All these states of mind constitutes of ***dvaita*** phase.

Mode of consciousness sets in when awareness has become one with consciousness: This ***nirguna*** state of mind. This state of mind is actually the consciousness and no awareness of cognition or communication happens.

This is ***advaita*** phase of mind or the state of the **Self** / ***Atman / Brahman / Para.***

Fullness, bliss, peace, silence, meaningful experience or experienced meaning etc.

In the mode of consciousness all the remaining modes take place sequentially and reversibly to make one knowledgeable and communicate the acquired or inherent knowledge.

Mode of insight is the result of perception or intuition or instinct. State of insight is permanent once understanding sets in or experience takes place compared to state of perception.

Knowing is the result of direct sensing by sense organs. Perception is correlation of sensed information with already known and preserved information stored in inner mental world. So is understanding or experience. Insight is the fruit of understanding. Intuition is a flash arising from insight or experience. The intuition flashes as an action to be performed in the form of verb (sense). Understanding is also thus a correlation of perception with already available senses or experiences or insight within created by earlier perceptions or sense or instinct naturally possessed by the organism through genes inherited. This analysis and correlation of this knowledge with modern scientific attempts [9, 10] helps to model human mental functions which have implications to artificial intelligence, mind-machine modelling, physiological psychology and neurology.

**References:**

[1]. Radhakrishnan, S., Indian Philosophy Vol.One and Vol. Two, Centenary Edition, Oxford University Press, Bombay, Calcutta, Madras, 1993.

[2]. Radhakrishnan. S. The Principal Upanishads, Indus, An imprint of Harper Collins Publishers India, 1994.

[3]Ramabrahmam, V. Being and Becoming: A Physics and Upanishadic Awareness of Time and Thought Process, LudusVitalis, XIII Num. 24, 2005, 139-154.

[4]. Ramabrahmam.V. , *The Science of Human Consciousness*. LudusVitalis, XV. No. 27, 2007, pp. 127-142.

[5]. Ramabrahmam, V., A cognitive science correlation of the meaning of *padaartha* in relation to human consciousness, mind and their functions, Paper presentation at International Conference on Indic Studies – 2013 on “Ancient Indian Wisdom and Modern World” on the theme “Ancient Indian Vision and Cognitive Science” between March 29-31, 2013 at Delhi,India, 2013.

[6]. Ramabrahmam, V., Indian spiritual awareness of body, mind and consciousness: A cognitive science insight, Paper presentation at 2nd International Conference on "Is Science able to explain the Scientist? (Science and Scientist-2014)" being held at Aachaarya Naagaarjuna University, Guntur, Andhrapradesh, India on November 28, 2014 – November 29, 2014 in collaboration with [Chaitanya Saraswat Institute](http://scsiscs.org), Siliguri, West Bengal, India, 2014.

[7]. Ramabrahmam, V, The hardware and software of human cognition and communication: A cognitive science perspective of orthodox Indian philosophical systems. paper presentation at Fourth International Conference: Science and Scientist-2016: August 26, 2016\_August 27, 2016, Prof. K. V. Gowda Memorial Auditorium, Bangalore University, 2016.

[8]. RamanujaTatacharya, N.S. Sabdabodhameemamsa-An Inquiry into Indian Theories of Verbal Cognition Part I - The Sentences and its SignificanceInstitut Francais De Pondichery, Pondicherry - Rashtriya Sanskrit Sansthan, New Delhi. 2005.

[9]. Perlovsky, Leonid. I. Neural Networks and Intellect, Oxford University Press, New York, Oxford, 2001.

[10]. Penrose, R. Emperor’s New Mind, Vintage, New York, 1990.