

A Literary Study on Action and Perception of Artha (Knowledge) through *Pancha Jnanendriya* (Five Sensory Organs): A Brief Review Study

*Vaidya Sandeep Aggarwal¹, *Dr. Suman Aggarwal², Dr. Sujit Kumar³, Dr. Shambhu P. Patel⁴

1. Professor and Principal, Department of *Kayachikitsa*, Vivek College of *Ayurvedic* Sciences & Hospital, Bijnor, Uttar Pradesh
 2. Assist Professor, Department of *Dravyaguna*, SKD Govt. *Ayurvedic* Medical College, Muzaffarnagar, Uttar Pradesh
 3. Assist. Professor, Department of *Kriya Sharir*, Vivek College of *Ayurvedic* Sciences & Hospital, Bijnor, Uttar Pradesh
 4. Assist. Professor, Department of *Dravyaguna*, Vivek College of *Ayurvedic* Sciences & Hospital, Bijnor, Uttar Pradesh
- *Corresponding Author: Vaidya Sandeep Aggarwal, Professor, Department of *Kayachikitsa*, Vivek College of *Ayurvedic* Sciences & Hospital, Bijnor, Uttar Pradesh

Abstract

Background *Buddhi* gives affirmative information. *Buddhi* is regarded as the vision gland. The fundamental wisdom or information that generates *Pancha Indriya Gyana* are the *Pancha Indriya Buddhis* (*Chakshu Buddhi*, *Shrotra Buddhi*, *Ghrana Buddhi*, *Rasana Buddhi*, and *Sparshana Buddhi*) (knowledge related to five sensory organs). The therapeutic importance of *Pancha Indriya Buddhi* has been understudied. The functions of *Pancha Indriya Buddhis* are similar to those of the brain's attachment cortices, and the abnormal states of *Indriya Buddhis* indicate various forms of Agnosia. **Aim and Objective** To evaluate the study on Action and Perception of *Artha* (Knowledge) through *Pancha Jnanendriya*, **Methodology – Source of Collection of Data** - Vivek Ayurvedic College Library, Bijnor, UP., the collection of material from, Agnivesha Charka Samhita, Principles of Anatomy and Physiology text book, Clinical Neuropsychology text book, Human cortical gustatory areas -Neuro report, different articles, Magazine's, and different other authentic websites like PubMed, data base. **Conclusion** The association cortices of the brain are represented by the *Pancha Indriya Buddhis*. In Ayurvedic classics, the functions of the traditional integrative area and prefrontal cortex or frontal attachment area specifically denote the functions of "*Buddhi*." Different forms of "Agnosia" are caused by the pathological states of *Indriya Buddhis*.

KEYWORDS: *Pancha Indriya Buddhi*, Association cortices, *Ayurveda*.

Introduction

Buddhi (intellect/cognition) is regarded as a distinct being in *Ayurveda*, working in tandem with the *Manas* (mind). After a thorough examination, *Buddhi* gives affirmative information. *Buddhi* is regarded as the vision gland.^[1] "*Buddhi*," according to "*Dalhana*," is an individual that comes to final decisions after weighing the pros and cons of an individual. ^[2] The *Jnanendriya* (sensory organs) are said to come into contact with their

respective faculties in *Ayurveda*. *Atma* is referred to as the "preceptor" or "doer" in this context, and information is gained by the use of instruments or *Karana Manas*, *Buddhi*, and *Indriya* are the instruments in question (*BuddhIndriya* and *Karmendriya*). There would be no understanding if these devices of perception are either missing or obstructed. *Manas* (mind) for learning the subsequent insight following the *Indriya Buddhis'* study. [3] The empirical soul (*Atma*) is endowed with the strength of perception, according to "Charaka." As the mind, intelligence, and sense faculties are connected, it (*Atma*) perceives objects. *Atma* is referred to as the "preceptor" or "doer" in this context, and information is gained by the use of instruments or *Karana Manas*, *Buddhi*, and *Indriya* are the instruments in question (*BuddhIndriya* and *Karmendriya*). There would be no understanding if these devices of perception are either missing or obstructed. [4]

The need for information arises in *Atma* during the vision process, and is then passed to *Manas*. *Manas* perceives the respective *Indriya Artha* or object of thought in conjunction with *Indriya*. Following that, the realistic benefits or drawbacks are determined. The *Buddhi* (intellect), which defines the object's basic properties, motivates people to communicate and behave intelligently (complex information processing/cognition/higher mental functions). Thus, the four essential components of awareness are *Atma*, *Manas*, *Indriya*, and *Indriyarthas*. The person with "*Buddhi Vibhrama*" (intellectual impairment) would be unable to assess things properly. [5]

"*Indriya Pancha Panchaka*" (five senses) is a list of 25 *Indriya*-related elements (terms) (sensory organs). They characterise *Indriyas'* structural and functional elements. *Pancha Indriya Dravya* (five sensory material), *Pancha Indriya Adhithana* (five sense organs Location), *Pancha Indriya Artha* (objects of perception/five sensory stimuli), and *Pancha Indriya Buddhi* comprise the "*Indriya Pancha Panchaka*" (five sensory perceptions). *Indriya Buddhis* are the *Indriyas'* essential intellect or awareness, which allows them to comprehend knowledge of the associated entity. This *Indriya Buddhi* aids in the perception of knowledge relevant to an *Indriya*. *Pancha Indriya Buddhis* include *Chakshu*, *Shrotra*, *Ghrana*, *Rasana*, and *Sparshana*. [6] Using recent science and literature, the current thesis aims to gain a greater understanding of the *Pancha Indriya Buddhis* and their therapeutic importance.

Aim and Objective

To evaluate the study on Action and Perception of *Artha* (Knowledge) through *Pancha Jnanendriya*

Methodology –

Source of Collection of Data - Vivek Ayurvedic College Library, Bijnor, UP.

In this article, the collection of material from, *Agnivesha Charka Samhita*, *Tortora GJ*, *Principles of Anatomy and Physiology* text book, *Clinical Neuropsychology* text book, *Human cortical gustatory areas* -Neuro report, different articles, Magazine's, and different other authentic websites like PubMed, data base.

Association cortices (*Pancha Indriya Buddhi*)

The sensory sensations are obtained through *Indriyas* (sense organs), which are similar to doors. *Jnanendriya* (sensory faculties) and *Karmendriya* (intellectual faculties) are two types of faculties identified in *Ayurveda*

(motor faculties). The cognitive process benefits from *Jnanendriya*, while the conative process benefits from *Karmendriya*. *Shrotra* (auditory sense organ) and *Chakshu* (visual sense organ) are the two most essential *Jnanendriya* in cognition and learning. Other sense organ perceptions, such as olfactory, gustatory, and tactile/somatosensory perceptions, are processed as *Anubhuta* (memory). *Shabda* (sound), *Sparsha* (touch), *Rupa* (vision), *rasa* (taste), and *Gandha* (smell) are the five essential artefacts of perception that are sensed by their respective sense organs. There are certain intrinsic sensations that can be sensed without the aid of any other sensory faculty by *Manas*.^[7] *Pancha Indriya Buddhis* are useful for the recognition of artefacts (*Chakshu*, *Shrotra*, *Ghrana*, *Rasana*, and *Sparshana Buddhis*).

Chakshu Buddhi

Chakshu Indriya Buddhi/Chakshu Buddhi offers the insight, details and understanding of *Rupa* (sight, vision). The visual cortex (area VI) primary lets us visually see the stimuli and the cortex visually linked helps us to perceive the things seen. Visual cortex is the alternate name for visual association. Visual cortex interaction gives the visual impressions significance. The lesions in region VI lead to blindness while those in the 'visuopsychic' cortex lead to 'mental blindness' syndrome, later called a '*Agnosis*,' a disorder that allows a patient to 'see' but not 'understand' what is seen. The primary field of vision is specialised in sensory stimuli and the visual field of association helps in developing and processing these primary visual sensations. Area VI is an important part of the continuum that allows for an awareness of vision and conscious experience.^[8] In the occipital lobe the field of visual contact (Areas 18 and 19) derives impulses from the main visual area and even from the thalamus. These fields of visual association connect current and past visual encounters and are important to the recognition and evaluation of what is seen.^[9] Visual association feature is similar to "*Chakshu Buddhi*" definition.

Buddhi Shrotra

Shrotra Indriya Buddhi/ Shrotra Buddhi offers *Shabda* (sound) insight or awareness and aids hearing and understanding of auditory stimulation. The auditory principal cortex is tonotopic and is the first auditory input cortical area of Heschl's gyrus. Auditory interaction cortex obtains information from the main auditory cortex and as an intermediate step of hierarchical production of auditory sounds is involved in the processing of complex sounds. The adaptation to tones takes place primarily in the primary auditory cortex, while in the audition cortex of the brain adaption to complex sounds happens.^[10] The region of the audio combination (area 22), which is inferior and post-primary in the cortex, enables one to perceive a signal as voice, music or noise. In the area of *Wernicke's*, a large zone in the left temporal and parietal lobes (area 22 and areas 39, 40), *Wernicke* understands the sense of speech by acknowledging the meanings of spoken language. The auditory interaction cortex's functions are identical to those of "*Shrotra Buddhi*."

Buddhi Ghrana

Ghrana Indriya Buddhi/Ghrana Buddhi offers *Gandha* (odour /smell) insight or awareness and supports the identification of olfactory sensations. The cortex orbit-frontal on the side of the frontal lobe is filled with sensory stimuli from the main olfactory region. This field allows one to recognise smells and distinguish

between various smells. The orbitofrontal cortex of the right hemisphere has more activation than the left during olfactory processing. The work of piriform cortex is heterogeneous and involves many facets of olfactory learning and memory. The amygdala is also functionally complex, encrypts the emotionality of the scent stimuli and helps connect environmental and biological odours. As the main neo-cortical objective of the primary olfactory cortex, the orbitofrontal cortex performs a broad range of higher-level functions relating to the synthesis, rewarding memory and associative learning. ^[11] The hippocampus was activated by odour discrimination, which involved a potential role in the olfactory work memory. *Broca's* field and the lower left frontal lobe included smell identifying, suggesting a mixture of sub vocal articulation and semantic connections. The hippocampus was discriminated against and had their part in serial smell comparisons (olfactory working memory). ^[12] The activities of the olfactory are similar to "*Ghrana Buddhi*," piriform cortex, amygdale, orbitofrontal regions and hippocampus.

Rasana Buddhi

Rasana Indriya Buddhi/Rasana Buddhi offers rasa (taste) information and aids in the identification of gustatory stimuli. The gustatory system's two taste areas are linked to various functions. The primary subcortical production area for gustatory feedback associated with flavour is the insula / operculum. ^[13] The parietal opercula zone (in the postcentral gyrus, directly adjacent to the somatosensory representation of the tongue), the insula, and the anterior temporal lobe are all linked to human cortical gustatory representation. The insula/opercula cortical portion of the human brain contains several gustatory regions. In contrast to principal taste areas, the ventral insula and parietal opercula cortex are secondary taste regions. The right hemisphere houses the human secondary gustatory region (caudolateral orbitofrontal cortex). This is consistent with other studies, implying that the right hemisphere has functional specialisation in gustation and olfaction. ^[14] The functions of "*Rasana Buddhi*" are similar to the functions of the insula/operculum, anterior temporal lobe, and secondary gustatory regions of the brain.

Buddhi Sparshana

Sparshana Indriya Buddhi/Sparshana Buddhi helps to sense the touch, recognise objects by touch, and recognise different somatosensory sensations by providing awareness or details of *Sparsha* (touch). The somatosensory integration area (areas 5 and 7) is located just below the main somatosensory area and receives input from the thalamus and other brain regions. This field allows us to feel an object's precise form and structure, as well as assess its position in relation to other objects and sense the interaction between body parts. The somatosensory connection region is where impressions of prior somatic sensory experiences are stored, allowing one to equate present stimuli to previous ones. We can identify objects like a pencil and a comb simply by touching them thanks to the somatosensory connection region. Somatosensory association areas have roles that are identical to those in "*Sparshana Buddhi*."

Somatosensory, visual, and auditory association areas surround the typical integrative region (areas 5, 7, 39, and 40). These zones, as well as the primary gustatory region, the primary olfactory area, the thalamus, and portions of the brain stem, send impulses to it. This field combines sensory interpretations from the

association centres with impulses from other parts of the brain, allowing for the creation of thoughts dependent on a variety of sensory inputs. It then sends messages to other areas of the brain, instructing them to respond appropriately to the sensory signals it has decoded. Humans have a well-developed prefrontal cortex, also known as the frontal association layer, which is located in the anterior portion of the frontal lobe (areas 9, 10, 11, and 12). The cerebral cortex, thalamus, hypothalamus, limbic system, and cerebellum all have extensive connections with this region. The cortex pre-frontal concerns the shaping of the personality, intelligence, diverse learning skills of an individual, knowledge recollection, initiative, judgement, foresight, thinking, awareness, imagination, temperament, preparation and creation of abstract concepts. "*Buddhi*," as described in Ayurvedic Classics, simply indicates the functions of the traditional integrative region and prefrontal cortex / frontal area of association.

Pathologies Regarding *Indriya Buddhi*

***Indriya Buddhi Vibhrama* [Agnosia of Sensory Organs]**

Agnosia is a visual condition that preserves feeling, but loses the capacity to identify or interpret a signal or realise its significance. Agnosia means "Sans cognisance." Agonised patients/ *Rogi* cannot perceive or acknowledge or remember what they see, hear, or experience. A gnosis results from lesions which detach and isolate high-level processing visual, additive, and somatosensory information. It is critical that the sensations are retained in the evaluation of agnosia: the sufferer is conscious, intellect is intact (or near intact) without any memory or language distress. Aperceptive or associative form may be agnosia. Aperceptive agnosia identifies an object detection deficiency mostly due to difficulties with early perceptive perception. The object is used as an object, but its significance is irrelevant. ^[15] Agnosia refers to a deficiency in the identity or essence of sensory sensations obtained. ^[16]

***Chakshu Buddhi Vibhrama* [Agnosia of Visual Organ]**

Visual agnosia is a deficiency in visual mode object perception despite intact basic visual functions and without any linguistic, memory or intelligent decline issues. Two wide categories are available; visual agnosia, appreciative and associative. Visual agnosia is characterised by a basic sensory level with preserved visual capacity. Visible object agnosia's (unable to recognise objects), simultaneous diagnostics (incapable of understanding the overall meaning of an object), prosopagnetics (incapables of recognising known faces), agnosia of the colour (deficiency of recognition, naming or other use of colour) and optic aphasia (incapable of "naming" a visual object) are different types of object; etc. ^[16]

***Shrotro Buddhi Vibhrama* [Agnosia of Auditory Organ]**

Auditory agnosia is not able, through usual perceptions of pure tones, to understand the context of the voice. Nonverbal and verbal forms may either occur or coexist separately. Cortical deafness (incapable for verbal and nonverbal hearing sounds to be recognised or to be understood), plain word deafness (capable of comprehending the spoken language when a patient is relatively normal at reading, writing and talking) etc., are various kinds of auditory agnosia. ^[16]

***Sparshana Buddhi Vibhrama* [Agnosia of Tactile Organ]**

Despite intact main and discrimination somesthetic sensations, selective failure in object awareness by contact is noted in tactile agnosia. It is a one-sided condition commonly caused by inferior contralateral parietal cortex lesions. There is a valuable therapeutic difference between "cortical and tactile agnosia" conditions. Aperceptive agnosia's generally require greater damages to the cortex of sensory association when association agnosia's are caused by cortico-cortic pathway defects or impairments in areas where semantic representation of items is processed. ^[16] All different types of tactile agnosia denoted as a *Sparshana* budget (disease of recognition for objects of distinguishing characteristics as weigh, density, structure and thermal properties) and all types of tactile agnosia

***Ghrana Buddhi Vibhrama* [Agnosia of Olfactory Organ]**

In the presence of normal acuity, the failure to detect typical odours is known as olfactory agnosia. The ability to sense an odour can be determined as the olfactory acuity. The detection of Olfactory is the capacity to name a particular smell with an odouring agent. The olfactory system is hierarchical, with peripheral sensory functions coming before the more central, higher-order information processing necessary for odour detection. ^[17]

***Rasana Buddhi Vibhrama* [Agnosia of Gustatory Organ]**

Gustatory agnosia is a relatively uncommon disorder. Patients of long-term bilateral temporal lobe dysfunction following surgical resection for seizure control have been known to develop it. Gustatory agnosia is a condition in which a patient may label an object but not determine whether or not it is edible. ^[18] The anteromedial temporal lobe plays a significant part in flavour level recognition. Gustatory agnosia is similar to "*Rasana Buddhi Vibhrama*," or "*Rasana Buddhi Vibhrama*." When sensory input is integrated into the texture of perception, it undergoes comprehensive associative elaboration and attentional regulation. ^[19] The role of specialised higher order association areas of the neocortex was to integrate such disparate cortical knowledge. ^[20,21] Adult patients/ Rogi with damage to various variations of these brain regions often develop Aperceptive and associative agnosia's. ^[22]

Discussion

The need for information arises in *Atma* during the vision process, and is then passed to *Manas*. *Manas* perceives the respective *Indriya Artha* or object of thought in conjunction with *Indriya*. Following that, the realistic benefits or drawbacks are determined. The *Buddhi* (intellect), which defines the object's basic properties, motivates people to communicate and behave intelligently (complex information processing/cognition/higher mental functions). The sensory sensations are obtained through *Indriyas* (sense organs), which are similar to doors. *Jnanendriya* (sensory faculties) and *Karmendriya* (intellectual faculties) are two types of faculties identified in *Ayurveda* (motor faculties). The cognitive process benefits from *Jnanendriya*, while the conative process benefits from *Karmendriya*. *Shrotra* (auditory sense organ) and *Chakshu* (visual sense organ) are the two most essential *Jnanendriya* in cognition and learning. Other sense

organ perceptions, such as olfactory, gustatory, and tactile/somatosensory perceptions, are processed as *Anubhuta* (memory). *Shabda* (sound), *Sparsha* (touch), *Rupa* (vision), *rasa* (taste), and *Gandha* (smell) are the five essential artefacts of perception that are sensed by their respective sense organs.

Agnosia means "Sans cognisance." Agonised patients cannot perceive or acknowledge or remember what they see, hear, or experience. A gnosis results from lesions which detach and isolate high-level processing visual, additive, and somatosensory information. It is critical that the sensations are retained in the evaluation of agnosia: the sufferer is conscious, intellect is intact (or near intact) without any memory or language distress. Aperceptive or associative form may be agnosia. Aperceptive agnosia identifies an object detection deficiency mostly due to difficulties with early perceptive perception.

Conclusion

The association cortices of the brain are represented by the *Pancha Indriya Buddhis*. The visual, auditory, and somatosensory interaction areas of the brain are represented by *Chakshu*, *Shrotra*, and *Sparshana Buddhi*, respectively, while the piriform cortex, amygdale, and orbitofrontal regions of the brain are represented by *Ghrana Buddhi*, *Rasana Buddhi* represents the insula/operculum/anterior temporal region of the brain's gustatory functions. As explained in Ayurvedic classics, the functions of the traditional integrative area and prefrontal cortex or frontal attachment area specifically denote the functions of "*Buddhi*." Different forms of "Agnosia" are caused by the pathological states of *Indriya Buddhis*.

ACKNOWLEDGE – I would like to give a sincere thanks to Blessings of Lord Krishna and my Guru's, for his constant guidance as well as for providing me necessary direction.

Source of Support and Finance- None

Conflicts of interest –Nil

References

1. Acharya VJ, editor. Agnivesha, Elaborated by Charaka and Dridhabala Commentary by Chakrapani. Charaka Samhita, Shareera Sthana, Katitha Purusheeya Adhyaya, 1/23. Varanasi: Chaukhamba Surbharati Prakashan; 2008. p. 289.
2. Acharya VJ, Acharya NR, editors. Sushruta. Sushruta Samhita Commentary by Dalhana. Shareera Sthana, Sarva Bhoota Chinta Shareera Adhyaya, 1/17. Varanasi: Chaukhamba Orientalia; 2009. p. 342.
3. Acharya VJ, editor. Agnivesha, Elaborated by Charaka and Dridhabala Commentary by Chakrapani. Charaka Samhita, Shareera Sthana, Katitha Purusheeya Adhyaya, 1/22. Varanasi: Chaukhamba Surbharati Prakashan; 2008. p. 289.
4. Acharya VJ, editor. Agnivesha, Elaborated by Charaka and Dridhabala Commentary by Chakrapani. Charaka Samhita, Shareera Sthana, Katitha Purusheeya Adhyaya, 1/54-55. Varanasi: Chaukhamba Surbharati Prakashan; 2008. p. 292.

5. Acharya VJ, editor. Agnivesha, Elaborated by Charaka and Dridhabala Commentary by Chakrapani. Charaka Samhita, Shareera Sthana, Katitha Purusheeya Adhyaya, 1/22. Varanasi: Chaukhamba Surbharati Prakashan; 2008. p. 297.
6. Acharya VJ, editor. Agnivesha, Elaborated by Charaka and Dridhabala Commentary by Chakrapani. Charaka Samhita, Sutra Sthana, *Indriya* Upakramaneeya Adhyaya, 8/3 & 12. Varanasi: Chaukhamba Surbharati Prakashan; 2008. p. 55-6.
7. Bhola S, Rao MP. Are rasa panchaka physical effects or pharmacological effects – A detail review? World J Pharm Res 2016; 5:404-15.
8. Zeki S. The visual association cortex. Curr Opin Neurobiol 1993; 3:155-9.
9. Tortora GJ, Derrickson BH. Principles of Anatomy and Physiology. The Brain and Cranial Nerves. 13th Ed. New Jersey: John Wiley & Sons; 2008. p. 553-4.
10. Malinowska U, Crone NE, Lenz FA, Cervenka M, Boatman-Reich D. Multi-regional adaptation in human auditory association cortex. Front Hum Neurosci 2017; 11:247.
11. Swanson LW, Petrovich GD. What is the amygdala? Trends Neurosci 1998; 21:323-31.
12. Kareken DA, Mosnik DM, Doty RL, Dzemidzic M, Hutchins GD. Functional anatomy of human odor sensation, discrimination, and identification in health and aging. Neuropsychology 2003; 17:482-95.
13. Simmons WK, Martin A, Barsalou LW. Pictures of appetizing foods activate gustatory cortices for taste and reward. Cereb Cortex 2005; 15:1602-8.
14. Small DM, Zald DH, Jones-Gotman M, Zatorre RJ, Pardo JV, Frey S, et al. Human cortical gustatory areas: A review of functional neuroimaging data. Neuro report 1999; 10:7-14.
15. Ghadiali EJ. Agnosia. Adv Clin Neurosci Rehabil 2004; 4:18-20.
16. Bauer RM. The agnosias. In: Snyder PJ, Nussbaum PD, Robins DL, editors. Clinical Neuropsychology: A Pocket Handbook for Assessment. 2nd ed. Washington, DC: American Psychological Association; 2006. p. 508-33.
17. Kopala L, Clark C. Implications of olfactory agnosia for understanding sex differences in schizophrenia. Schizophr Bull 1990; 16:255-61.
18. Schultz S, Grafton L, Gater DR. Poster 215 gustatory agnosia following herpes simplex virus encephalitis: A Case report. PM R 2016; 8:S231.
19. Mesulam MM. From sensation to cognition. Brain 1998; 121 (Pt 6):1013-52.
20. Ghazanfar AA, Schroeder CE. Is neocortex essentially multisensory Trends Cogn Sci 2006; 10:278-85.
21. Koziol LF, Budding DE, Chidekel D. Sensory integration, sensory processing, and sensory modulation disorders: Putative functional neuroanatomic underpinnings. Cerebellum 2011; 10:770-92.
22. Gupta K, Mamidi P. *Pancha Indriya Buddhi*: Association cortices, DOI: 10.4103/ijny.ijoyppp_10_17. Int J Yoga - Philosop Psychol Parapsychol 2018;6: 61-5.