



# Models of Cognitive Processes as Depicted in the *Sutta* Literature

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**Date of Call for Article:**

27 May, 2024

**Article Received Date:**

25 July, 2024

**Date of sending for peer review:**

27 August, 2024

**Date of receiving from peer review:**

22.09.2024

**Date of Revision:**

02 October, 2024

**Date of Acceptance:**

14 November, 2024

**Date of Publication:**

26 January, 2025

## Abstract

**Background:** Buddhism renders all the miseries and sorrows in human beings to the evils inherent in the cognitive process. In the *Pāli* Commentaries and Sub-commentaries, a comprehensive model of cognitive process is discussed in the terminology of *Citta-Vīthi*, however, this concept is depicted in the original *Sutta*, *Vinaya*, and *Abhidhamma* Canonical texts at the very basic level. In such teachings, knowledge acquired through sense perception is taken as the phenomena leading towards sorrow and misery.

**Objective:** The objective of the study is to explore the models of five aggregates, six *āyatana* and eighteen *dhātus*, dependent origination, and thought proliferation in *Sutta* teachings.

**Methodology:** this research work has adopted the critical thinking skill research method to explore the cognitive process models depicted in the *Sutta* Literature.

**Result:** From such study, it has been found that in *Sutta* teachings cognitive process is depicted as the models of five aggregates, six *āyatana* and eighteen *dhātus*, dependent origination, and thought proliferation

**Conclusion:** The teachings of the Buddha always focus on the rational understanding (*sammā-dīṭṭhi*) of the subject matter how the senses work and how the misery entails in these processes. Thus, it is important to explore the models of cognitive processes depicted in the original *Sutta* literature. For that purpose. At the end of this research, a conclusion is drawn that every event of the cognitive process begins from a simple sensation process and proceeds by degrees to a discriminative apprehension of the sense object.

**Keywords :** *Āyatana*, *dhātus*, *Pañcakkhanda*, *Paṭiccasamuppāda*, *papañcasāṅkhā*

**Paper Type:** Research Paper

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## Background

Buddha's teachings are found revolutionary against the existing concept of soul or self (*Ātman*) in understanding the perceptual process during his time. Instead of assigning the abstract concept 'soul' for its role in operating the cognitive process, Buddha describes this process as a law of consciousness (*citta-niyāma*) (Muller 272). Attribution of the cognitive process to the substantial agent is represented by the *Upanishadic* philosophy in contemporary India. According to this philosophy, an inherent permanent agent residing in beings carries all the mental activities like thinking, feeling, memory, and other relevant mental processes (Sarachandra 3). Buddhist teachings arise as a counter to this idea where cognitive process is taken as a natural process as there are law of seed (*bija-niyāma*), law of season (*utu-niyāma*), law of action (*kamma-niyāma*), law of nature (*dhamma-niyāma*) and law of *citta* (*citta-niyāma*)- "*bījanīyāmaṃ utunīyāmaṃ kammanīyāmaṃ dhammanīyāmaṃ cittanīyāmantia*" (272). Thus, in Buddhism, the cognitive process as a distinct natural law emerges against the contemporary *Upanishadic* doctrine of permanent soul for the process of cognizing the outer world (Karunadasa 138).

The Buddhist concept of cognitive process (*citta-vīthi*) is a unique contribution to human knowledge. In Buddhism, this concept is enumerated as a systematic and formulated theory of sense perception which comprehensively explains the workings of the mind when a physical or mental object appears at the six sense doors. It is a core Buddhist teaching for mental purification where the tendency of the mind to generate defilements during this process can be dictated and lead to a rational understanding of how the process of mental impurities can be eradicated. The cognitive process model distinctly appears in the *Theravādin* sources with the terminology of *citta-vīthi*, the pathway of consciousness literally.

The comprehensive and systematic enumeration of cognitive process (*citta-vīthi*) appears for the first time in the *Pāli* works such as the *Visuddhimagga*, the *Abhidhammāvatāra*, and the *Abhidhamma* commentarial literature that are rendered in the 5<sup>th</sup> century A.D. The idea is further developed and elaborated in the literary works like the *Visuddhimagga Mahā-ṭīkā*, and the *Abhidhamma Mūla-ṭīkā* that were written during the 7<sup>th</sup>-8<sup>th</sup> century A.D. In the compendium of *Abhidhamma*, the *Abhidhammatthasaṅgaha* and its commentarial work, the *Abhidhammatthavibhāvinī-ṭīkā*, the idea is discussed more comprehensively. These works were composed during the time of the 8<sup>th</sup> -12<sup>th</sup> century A.D. The concept appears as a final attempt along with some alternative and comprehensive ideas in the late *Pāli* texts like *Paramatthadīpanī* and *Abhidhammattha Navanita-ṭīkā* that were rendered during the 19<sup>th</sup> -20<sup>th</sup> century A.D.

Although the comprehensive concept of the cognitive process was formulated during the commentarial period led by the Buddhaghosa and Buddhadatta and further enumerated in the sub-commentarial period, the concept originated in the earlier canonical texts like *Sutta* and *Vinaya*, the *Abhidhamma* canonical texts that were written before 2<sup>nd</sup> century B.C. According to the *Theravāda* tradition, the teachings of the Buddha that are discussed in the commentaries and sub-commentaries should have their base and root in the *Sutta* literature. With this proposition, this research work seeks to find the origin of the comprehensive and systematized concept of cognitive process (*citta-vīthi*) in the *Sutta* literature.

In *Sutta's* teachings, the concept of cognitive process is depicted as the process that begins from a sensory contact and gradually leads to the complicated process, the discriminative apprehension of the sense object. The entire process is depicted as resulting in *papañcasāññāsāṅkhā* i.e. the process of complication and proliferation related to the sense object. These teachings are focused on eradicating all sorts of miseries that arise during the mode of sense-perception and encourage the complete cessation of those sufferings through cessation of the activities of the sensual contact. Thus, in *Sutta* literature, such pattern of the cognitive process can be detected in the different models like five aggregates, six āyatana

and eighteen *dhātus*, *paṭiccasamuppāda* and the thought proliferation (*papañcasāṅkhā*) (Gethin 35-53).

### Statement of the Problem

The cognitive process model is comprehensively and systematically discussed in the *pāli* commentary and sub-commentary literature. Commentaries and sub-commentaries are the further enumeration of the fundamental ideas expressed in the *Sutta* literature. So, the systematic discussion of the concept of cognitive process should have its roots in the *Sutta* literature. With this assumption, the present research work has set the following research problem.

- a. What are the cognitive process models depicted in the *Sutta* literature ?

### Research Objectives

To meet the research problem as stated above, the following study objectives have been adopted for this research work.

- a. To explore the cognitive process models that are depicted in the *Sutta* literature.

### Methodology

This research work aims to find out the basic cognitive factors rooted in the *Sutta* literature and to analyze how the different models of cognitive process are depicted variously in the *Sutta* literature. For this purpose, the researcher has taken a position of interpretivism research paradigm and inductive reasoning approach. To align with these research philosophies, this work has applied exploratory research methods for the collection and interpretation of the related data. According to this method, this research work aims to explore specific aspects of the research problem and to investigate and understand the reality related to that problem.

In this work, the relevant *Suttas* from the *Dīgha Nikāya*, *Majjhima Nikāya*, *Āṅguttara Nikāya*, *Saṃyutta Nikāya*, *Khuddaka Nikāya* have been collected applying the purposive sampling technique for the selection of required data. These data have been analyzed to find out the answer to the research question. In the process of data analysis, the collected data were processed to identify the common patterns in them, and finally, they were critically analyzed to reach the research objectives. Qualitative analytical processes such as coding of the information, its classification, comparison, and interpretation have been carried out during the analysis of the collected data. The critical thinking skill method has been applied to explore the pattern of cognitive process that is depicted in the collected data.

### Analysis

#### Analysis of Five Aggregate Model of Cognitive Process

In Buddhist literature, the five-aggregate model of cognitive process has been presented as the experience that we generate in every moment about material and mental factors like feeling (*vedanā*), perception (*saññā*), mental formation (*saṅkhāra*), consciousness (*viññāṇa*), and material form (*rūpa*) (Gethin 35-53). These five aggregates are described as the constituents of a personality and the cognitive factors for the first-person subjective experience. Among these constituents, the material form (*rūpa*) represents the physical body, the sensory consciousness (*viññāṇa*) functions as cognizing the sense object, the feeling (*vedanā*) shows the subjective-affective effects related to that object, the perception (*saññā*) represents being aware of attributes related to that object and the faculty of volition (*saṅkhāra*) shows reaction or the purposive aspect of the mind. These five aggregates are interpreted as the constituents of the personality (Bronkhorst 28).

In this system of perceptual experience, *rūpa* represents a material form with the five senses of sight, hearing, smell, taste, and touch; *vedanā* feels the sense-object as pleasant, unpleasant and neutral subjective experience; *saññā* perceives the object on account of its old memory; *saṅkhāra* reacts to the sense-object by provoking attachment, aversion and delusion; and *viññāṇa* is a faculty of awareness towards the sense-object (Harvey 56). According to this model of cognitive process, suffering arises when one cling to these five aggregates (*pañcupādānakkhandhā*), and the way of coming out of the suffering is by relinquishing attachments to these aggregates.

In the *Khandha Sutta* of *Samyutta Nikāya* Buddha enumerates the five aggregates as follows and their role in generating suffering is depicted as follows:

*Pañca, bhikkhave, khandhe desessāmi...rūpaṃ ... ayaṃ vuccati rūpakkhandho... yā kāci vedanā ... vedanākkhandho ... yā kāci saññā ... saññākkhandho... ye keci saṅkhārā ... saṅkhārakkhandho... yaṃ kiñci viññāṇaṃ ... viññāṇakkhandho. Ime vuccanti, bhikkhave, pañcakkhandhā. Katame ca, bhikkhave, pañcupādānakkhandhā? rūpaṃ... upādāniyaṃ, ayaṃ vuccati rūpupādānakkhandho...vedanā ... upādāniyā...vedanupādānakkhandho.. saññā ... upādāniyā...saññupādānakkhandho...saṅkhārā ... sāsavā upādāniyā... saṅkhārupādānakkhandho. Yaṃ kiñci viññāṇaṃ ...upādāniyaṃ...viññāṇupādānakkhandho. Ime vuccanti, bhikkhave, pañcupādānakkhandhā”ti (Feer 47-48).*

According to this model of cognitive process, when any one of the six sense doors comes into contact with its concerned sense object, the respective consciousness arises as a bare cognizing faculty. In this process, the mental faculty *viññāṇa* simply cognizes that, for instance, a sound has come in contact with the ear. Now the second part of the mind, *saññā* functions as recognizing the sound, perhaps as words of abuse, or as words of praise. It not only recognizes but also evaluates: the abuse is bad, or the praise is good. In the process, at the moment when a sound touches the ear sense door, there is a vibration, a neutral vibration. If the *saññā* (perception) says that it is bad, this vibration changes into unpleasant physical sensations or vibration. If the *saññā* says that it is a word of praise, then immediately this neutral vibration becomes very pleasant. These sensations comprise the third part of the mind, the *vedanā*. The *vedanā* feels the object either with pleasant, unpleasant, or neutral sensations. Depending on this sensation, a mental factor of *saṅkhāra* reacts to that sensation either with craving, aversion, or with neutral volition. In this process, the faculty of *saṅkhāra* is responsible for the formation of good, bad, or neutral *karma*. These four mental elements always function in association with the *rūpa* element that ultimately makes five aggregates (“10 Day Vipassana Course-Day 4” 1:08:24). The Five aggregate model of cognitive process is as follows:

Five Aggregate Models of Cognitive Process

*Viññāṇa* → *Saññā* → *Vedanā* → *Saṅkhāra*

### Analysis of the Six *Āyatana* Impingement Model of Cognitive Process

In *Sutta's* teachings, the continuity of the cognitive series is shown as the rapid flow of sense consciousness that arises due to the impingements of the sense bases (*āyatana*) with their respective sense objects. The six sense bases like eye (*cakkhu*), ear (*sota*), nose (*ghāṇa*), tongue (*jivhā*), body (*kaya*) and mind (*mano*) are known as internal bases (*ajjhakkāni āyatanāni*) and their respective sense objects like form (*rūpa*), sound (*sadda*), odor (*gandha*), taste (*rasa*), tangible (*phoṭṭhabba*) and mental phenomena (*dhamma*) are known as external bases (*bāhirāni āyatanāni*). In *suttas*, these sense bases are shown in pairs such as the eye and visible objects, the ear and sounds, the nose and odors, the tongue and tastes, the body and tactile objects, and the mind and mental phenomena. In *Saḷāyatanasamyuttaṃ* the idea is depicted as “*dvayaṃ vo, bhikkhave, desessāmi. taṃ suṇātha. kiñca, bhikkhave, dvayaṃ?*

*cakkhuñceva rūpā ca, sotañceva saddā ca, ghānañceva gandhā ca, jivhā ceva rasā ca, kāyo ceva phoṭṭhabbā ca, mano ceva dhammā ca — idaṃ vuccati, bhikkhave, dvayaṃ*” (Feer 67).

In *Dutiyaadvaya Sutta*, Buddha describes the functions of these bases (*āyatana*) as causing the arising of the sense consciousness (*viññāṇa*) which is the first stage in the cognitive processes. According to this sutta, eye-consciousness arises due to the impingement of the eye with the forms, ear consciousness arises due to the impingement of the ear with the sound, the nose consciousness with the smell, the tongue consciousness with the taste, body consciousness with the touch and mind consciousness with the mental phenomena. This process is depicted in the sutta as follows.

*cakkhuñca paṭicca rūpe ca uppajjati cakkhaviññāṇaṃ...sotañca paṭicca saddecuppajjati sotaviññāṇaṃ ... ghānañca paṭicca gandhecuppajjati ghānaviññāṇaṃ .... jivhañca paṭicca rase ca uppajjati jivhāviññāṇaṃ... kāyañca paṭicca phoṭṭhabbe ca uppajjati kāyaviññāṇaṃ .... manañca paṭicca dhamme ca uppajjati manoviññāṇaṃ* (67-69).

In *suttas*, thus, six sense bases are resorted to the perceptual process. These are depicted as the plate-form for receiving and transforming the stimuli. Each sense base is supposed to receive such stimuli from its corresponding sense object and not from the others. For example, a form cannot be received by the bases of the ear and sound cannot be received by the eye. Hence, the six senses are like receptors that accept stimuli or raw data from their objects. Similarly, after receiving these stimuli, the six sense bases transmit them in the form of sensor information for further complex perceptual processes like contact (*phassa*), feeling (*vedanā*), thinking (*saññā*), and others.

Six *āyatana* impingement model of cognitive process is as follows:

Six *Āyatana* Impingement Model of Cognitive Process

Sense faculty + sense object —————> sense consciousness

### Analysis of Dependent Origination Model of Cognitive Process

Buddha is purported, upon his enlightenment, to have discovered not only the fact that experience consists of a series of discrete moments but also an understanding of the causal processes responsible for the formation and transition of such states. The most referenced definition for *paṭiccasamuppāda* comes from the *Paṭiccasamuppāda Sutta* from *Samyutta Nikāya*. In the *sutta*, *paṭiccasamuppāda* is defined as an arising process of the whole mass of *dukkha* which is encapsulated in the twelve links as follows.

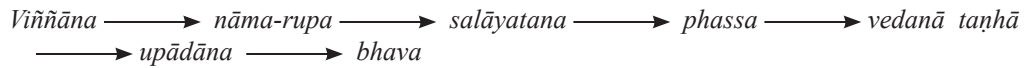
*Anuloma- Avijjāpaccayā sankhārā; sankhārapaccayā viññāṇaṃ; viññāṇapaccayā nāma-rupam; nāma-rupa paccayā salāyatanam; salāyatanāpaccayā phasso; phassapaccayā vedanā; vedanāpaccayā tanhā; tanhāpaccayā upādānam; upādāna paccayā bhavo; bhavapaccayā jāti; jātipaccayā jarāmaranam soka-parideva-dukkha-domanassa upāyāsā sambavanti; Paṭiloma- Avijjāya tveva asesavirāga-nirodhā saṅkhāranirodho, saṅkhāranirodhā viññāṇanirodho, viññāṇanirodhā nāmarūpanirodho, nāmarūpanirodhā salāyatananirodho, salāyatananirodhā phassanirodho, phassanirodhā vedanānirodho, vedanānirodhā tanhānirodho, tanhānirodhā upādānanirodho, upādānanirodhā bhavanirodho, bhavanirodhā jātinirodho, jātinirodhā jarāmaranaṃ sokaparidevadukkhadomanassupāyāsā nirujjhanti – evametassa kevalassa dukkhakkhandhassa nirodho hotī”ti* (1-2).

[Forward Order: With ignorance as condition, volitional formations arise; with volitional formations as condition, consciousness; with consciousness as condition, mind-body; with mind-body as condition, the six sense bases; with the six sense bases as condition, contact; with contact as condition, feeling; with feeling as condition, craving; with craving as condition, clinging; with clinging as condition, becoming; with becoming as condition, birth; with birth as condition, aging-and-death, sorrow, lamentation, physical and mental sufferings, and despair arises. Reverse Order: With the

complete cessation of ignorance, volitional formations cease; with the cessation of volitional formation, consciousness ceases; with the cessation of consciousness, mind-body cease; with the cessation of mind-body, the six senses cease; with the cessation of the six senses, contact ceases; with the cessation of contact, feeling ceases; with the cessation of feeling, craving ceases; with the cessation of craving, clinging ceases; with the cessation of clinging, the process of becoming ceases; with the cessation of the process of becoming, birth ceases; with the cessation of birth, aging and death cease, together with sorrow, lamentation, physical and mental sufferings and despair ceases.]

The twelve links of the chain of dependent origination are divided into three traditional categories- past, present, and future. The first two cognitive factors (*avijjā* and *saṃkhāra*) belong to the past category, the middle eight factors like *viññāna*, *nāma-rūpa*, *salāyatana*, *phassa*, *vedanā*, *taṇhā*, *upādāna* and *bhava* belong to the present category and the remaining two factors (*jāti* and *jarā-maraṇa*) belong to the future categories. The eight elements linked in this second group can be seen working as causal factors in the cognitive process. The first link in the middle group of dependent originations is *viññāna*, the rebirth consciousness. As soon as the rebirth consciousness arises, the mind-matter factor emerges. The third link of this middle group is the six sense doors (*salāyatana*), usually described as the six organs of cognition; namely, the visual, auditory, olfactory, gustatory, tactile, and thinking organs. In the cognitive process, the six sense doors as condition, and the fourth link of the dependent origination, the *phassa* (contact) arises which is a cognitive factor of bare sensory experience devoid of any subjective content. Contact conditions the fifth link of the middle group, *vedanā* arises. The sixth and seventh links which follow the *vedanā* link are craving (*taṇhā*) and clinging (*upādāna*), the intensified form of craving. Craving conditions for the arising of the eighth link i.e. becoming (*bhava*). The dependent origination model of the cognitive process is as follows:

#### Dependent Origination Model of Cognitive Process



#### Analysis of Thought Proliferation Model of Cognitive Process

In Early Buddhism, the cognitive process is depicted as the process that begins from the impingement between the sense faculty and the sense object. In the teachings in the *sutta*, Buddha teaches his disciples to guard their sense faculties whenever they come in contact with the sense objects. These teachings are intended to monitor the whole cognitive process to contemplate the dangers of resulting unwholesome mental activities that may arise during that course. In a few places in the *vinaya* and many places in the *sutta* literature, such teachings are found in much-diversified length and content. Cognitive factors that arise in such teachings follow particular patterns and the perceptual structure can be drawn.

The analysis of the cognitive process depicted in the *sutta* teachings is empirical and pragmatic. Moreover, the relationships between the cognitive factors are not found simply linear but sequential and simultaneous as well. So, the cognitive process depicted in early teachings should be interpreted as the complexity of these factors and their functions, which run repeatedly, continuously, and endlessly. The *Madhupiṇḍika Sutta* and *Dasuttara Sutta* can be taken as good examples to understand the complex series of cognitive processes constituting several cognitive factors after the stages of contact (*phassa*) and feeling (*vedanā*). The following excerpt from the *Madhupiṇḍika Sutta* depicts how the cognitive process of the eye sense operates leading to misery.

*Cakkhuñcāvuso, paṭicca rūpe ca uppajjati cakkhuvīññānaṃ, tiṇṇaṃ saṅgati phasso, phassapaccayā vedanā, yaṃ vedeti taṃ sañjānāti, yaṃ sañjānāti taṃ vitakketi, yaṃ vitakketi*

*taṃ papañceti, yaṃ papañceti tatonidānaṃ purisaṃ papañcasaññāsāṅkhā samudācaranti atītānāgatapaccuppannesu cakkhuvīññāṇesu rūpesu* (Trenckner 111-12).

[Translation- for the arising of *cakkhuvīññāṇa*, the eye needs to contact the visual forms. The meeting of the three conditions for contact. Due to the contact of these three phenomena, there arises feeling. In the cognitive process, the feeling conditions for cognizing (*Saññā*) and the cognizing conditions for the person to think about (*Vitakka*). In this process, one complicates (*Papañceti*) on what one thinks about and based on what a person complicates, the perceptions & categories of complication assail him/her (*Papañcasaññāsāṅkhā*) concerning past, present, & future forms cognizable through the eye.]

According to this *sutta*, the entire process is supposed to result in *papañcasañkhā* i.e. desire or attachment, so, the arising of *papañca* in a person is related to the process of sense-perception and the cessation of *papañca* by the means of complete cessation of the activities of the six spheres of contact. This process can be shown in the following diagram:

Cognitive Process Model According to *Madhupiṇḍika Sutta*

Impingement of *Rūpa* & *Cakkhu* → *Cakkhuvīññāṇa*; Meeting of *Rūpa*, *Cakkhu* & *Cakkhuvīññāṇa* → *Phassa* → *Vedanā* → *Saññā* → *Vitakka* → *Papañca*  
*Papañcasaññāsāṅkhā*

Similarly, in the *Dasuttara Sutta* of the *Dīgha Nikāya*, the feelings, perception, and thoughts are depicted arising in sequence leading to a miserable situation as expressed in the following lines:

“*Dhātunānattaṃ paṭicca uppajjati phassanānattaṃ, phassanānattaṃ paṭicca uppajjati vedanānānattaṃ, vedanānānattaṃ paṭicca uppajjati saññānānattaṃ, saññānānattaṃ paṭicca uppajjati saṅkappanānattaṃ, saṅkappanānattaṃ paṭicca uppajjati chandanānattaṃ, chandanānattaṃ paṭicca uppajjati pariḷahanānattaṃ, pariḷahanānattaṃ paṭicca uppajjati pariyesanānānattaṃ, pariyesanānānattaṃ paṭicca uppajjati lābhanānattaṃ saṅkappanānattaṃ*” (Carpenter 289).

[Translation- On account of difference in the sensory element, a different contact takes place, on account of difference in contact difference in feeling arises, hence difference in perception, hence difference in purposive thought, hence difference in active desire, hence difference in greed, hence difference in pursuit, hence difference in gain arises.] (Davids 263)

In this *sutta*, feeling (*vedanā*) is followed by perception (*saññā*) and after that mental state, cognitive factors like thinking (*vitakketi*), mental proliferation (*papañceti*), intention (*Chanda*), or obsession (*pariḷāha*) arise in the process. These *suttas* present a cognitive format beginning from the physical contact between the five senses and their respective objects which finally results in mental proliferation. This process can be shown in the following diagram:

Cognitive Process Model According to *Dasuttara Sutta*

Impingement of *Rūpa* & *Cakkhu* → *Cakkhuvīññāṇa*; Meeting of *Rūpa*, *Cakkhu* & *Cakkhuvīññāṇa* → *Phassa* → *Vedanā* → *Saññā* → *Vitakka* → *Papañca*  
*chanda* → *pariḷāha*

Other descriptions in the *sutta* literature are similar as far as depicting the cognitive factor perception (*saññā*) and then branch off in different ways. In the *Pariyesanānānatta Sutta*, Buddha teaches how the cognitive process arises following the cognitive stage of perception (*saññā*). According to this *sutta*, as conditioned by the *saññā*, there arise thoughts related to form, sound, smell, taste, touch, and mind-object known as *sankappa*. After *sankappa*, dependent on the diversity of thoughts, there

arises the diversity of desires related to, sound, smell, taste, touch, and mind-object which is termed as *Chanda*. Again, dependent on those desires, there arises a diversity of passion related to those sense objects which is known as *parigraha*. Finally, dependent on the diversity of the passions associated with those objects there arises diversity of searching for those objects (*pariyesanā*). In this *sutta*, the idea is depicted as: “*dhātunānattam, bhikkhave, paṭicca uppajjati saññānānattam, saññānānattam paṭicca uppajjati saṅkappanānattam, saṅkappanānattam paṭicca uppajjati chandanānattam, chandanānattam paṭicca uppajjati pariḷāhanānattam, pariḷāhanānattam paṭicca uppajjati pariyesanānānattam*” (Feer 143). According to this *sutta*, the process can be shown in the following diagram:

Cognitive Process Model According to *Pariyesanānānatta Sutta*

Impingement of *Rūpa & Cakkhu* → *Cakkhuvīññāṇa*; Meeting of *Rūpa, Cakkhu & Cakkhuvīññāṇa* → *Phassa* → *Vedanā* → *Saññā* → *saṅkappa*  
→ *chanda* → *parigraha*

Similarly, in *Āhuneyyavagga* from the *Aṅguttara Nikāya*, after the stage of contact (*phassa*), a series of cognitive faculties are shown as the feeling (*vedanā*), perception (*saññā*), volition (*cetanā*), craving (*taṇhā*), applied thought (*vitakka*) and examination of the object in the series (*vicāra*). The cognitive process is depicted as when the sense faculty (eye) comes in contact with its sense object the eye-consciousness arises. Meeting these three causes for the arising of the eye-contact (*cakkkhusamphassa*). After this, the succeeding cognitive factors arise as the feeling (*vedanā*) perception (*saññā*), volition (*cetanā*), craving (*taṇhā*), applied thought (*vitakka*), and examination of the object (*vicāra*) in the series one after the other. In this *sutta*, the process is depicted in the following lines:

*puna caparam, bhikkhave, idhekacco puggalo cakkkhumiṃ aniccānupassī viharati ... rūpesu ... cakkhuvīññāṇe ... cakkkhusamphasse ... cakkkhusamphassajāya vedanāya ... rūpasaññāya ... rūpasāñcetanāya ... rūpataṇhāya ... rūpavitakke ... rūpavicāre ... pañcakkhandhe ... rūpakkhandhe... vedanākkhandhe... saññākkhandhe... saṅkhārakkhandhe... vīññākkhandhe aniccānupassī viharati ... pe ... dukkhānupassī viharati... anattānupassī viharati... khayānupassī viharati... vayānupassī viharati... virāgānupassī viharati... nirodhānupassī viharati... paṭinissaggānupassī viharati ... pe ... lokassā”ti* (Hardy 146-47).

[Translation- Bhikkhus, here, some person dwells contemplating impermanence in the eye ... in visible object...in eye consciousness... in eye-contact... in feeling born of eye-contact... in the perception of forms... in volition regarding forms... in craving for forms... in thought about forms... in an examination of forms... Here some person dwells contemplating impermanence in the form aggregate, feeling aggregate, perception aggregate, volitional activities aggregate, and consciousness aggregate.]

According to the *Āhuneyyavagga*, the process can be shown in the following diagram:

Cognitive Process Model According to *Āhuneyyavagga*

Impingement of *Rūpa & Cakkhu* → *Cakkhuvīññāṇa*; Meeting of *Rūpa, Cakkhu & Cakkhuvīññāṇa* → *Phassa* → *Vedanā* → *Saññā* → *cetanā* → *taṇhā* → *vitakka* → *vicāra*

The pattern of cognitive process is also supported by the *Cūḷarāhulovādasutta* with slight variation. In this *sutta*, the cognitive factors like feeling (*vedanā*), cognition (*saññā*), constructing activities (*saṅkhāra*), and discernment (*vīññāṇa*) all are shown to arise from the stimulation (*phassa*).



Buddha teaches his son Rahula that feelings (*vedanā*), perceptions (*saññā*), determinations (*sankhāra*), and consciousness (*viññāṇa*) arise on account of sense contact in a particular sequence. According to this *sutta*, the learned noble disciple while seeing the sense object turns away from the eye, the visible object, the eye-consciousness, the eye contact, and all feelings, perceptions, determinations, and the conscious things born of that eye contact. In the *sutta*, it is depicted as “*evaṃ passam, rāhula, sutavā ariyasāvako cakkhusmiṃ nibbindati, rūpesu nibbindati, cakkhuvīññāṇe nibbindati, cakkhusamphasse nibbindati, yamidaṃ cakkhusamphassapaccayā uppajjati vedanāgatam saññāgatam sankhāragatam viññāṇagatam tasmimpi nibbindati*” (Chalmers 279). According to this *sutta*, the process can be shown in the following diagram:

#### Cognitive Process Model According to *Cūḷarāhulovādasutta*

Impingement of *Rūpa* & *Cakkhu* → *Cakkhuvīññāṇa*; Meeting of *Rūpa*, *Cakkhu* & *Cakkhuvīññāṇa* → *Phassa* → *Vedanā* → *Saññā* → *sankhāra viññāṇa*

Thus, analyzing various *sutta* and *vinaya* literature, sense consciousness (say *cakkhuvīññāṇa*) can be interpreted as attention or state of awareness of the visual sense-faculty since this faculty is shown arising before the state of *phassa*. In the process, *saññā* and *viññāṇa* both have been rendered to mean consciousness, and *saññā* is supposed to succeed the state of *viññāṇa* and is considered to recognize and evaluate the sense object. *Vedanā* is taken as an emotional aspect of the cognitive process and is supposed to be a base for the arising of *saññā*. *Saññā* cognizes the object and plays the role of the subjective and intentional aspects in the perceptual process. After the *Saññā*, *Vitakka* argues about the object, and then the process of proliferation occurs (*Papañceti*). Then in the process, one starts to think about a lot of things about the present, past, and future things related to the objects.

In the early rendering of *sutta* and *vinaya*, the cognitive process is illustrated in terms of the cognitive factors that arise in the cognitive series with their specific functions. The common cognitive factors that often occur in these texts are sense consciousness (*viññāṇa*), contact (*phassa*), feeling (*vedanā*), perception (*saññā*), thinking (*sankappa/vitakka*), mental proliferation (*papañca*), craving (*taṇhā*), *upādāna* (clinging), volition (*cetanā*), examination of the object in the series (*vicāra*), desire (*chanda*), diversity of passion (*parigraha*), obsession (*parilāha*) etc. These factors are always in accord with a causal relationship largely so that all *puthujjana* have similar reactions and experiences in a particular situation (Tao 42). So, these factors are depicted following a similar pattern in *sutta* and *vinaya*. Thus, the general order of the perceptual process can be synthesized as follows:

#### Synthesizing the Cognitive Process Model from *Sutta* Literature

Impingement of *Rūpa* & *Cakkhu* → *Cakkhuvīññāṇa*; Meeting of *Rūpa*, *Cakkhu* & *Cakkhuvīññāṇa* → *Phassa* → *Vedanā* → *Saññā* → Various Constructing Activities

### Analysis of Cognitive Process Depicted in the *Paṭisambhidāmagga*

The text *Paṭisambhidāmagga* (The Path of Discrimination) which was composed in the 2<sup>nd</sup> century A.D. is collected under the *Khuddhakanikāya*, however, it is taken as a forerunner of *Vimuttimaggā* and *Visuddhimaggā* (Hinüber 60). A.K. Warder opines that a substantial part of the *Paṭisambhidāmagga* was written during the same period of *Dhammasaṅgaṇī* and some part of it is written even earlier (Warder XXXV). *Paṭisambhidāmagga* represents a doctrinal progression parallel to *Dhammasaṅgaṇī* and *Vibhaṅga* (Ronkin 91). So, despite being of *Sutta* text, *Paṭisambhidāmagga* presents patterns similar to

the *Abhidhamma* texts in terms of subject matter and presentation style.

In the section of *Cariyānānattañāniddeso* of the first book i.e. *Mahāvagga* of *Paṭisambhidāmagga*, there is a description of three kinds of behavior: behavior of consciousness, behavior of unknowing, and behavior of knowledge. Basic factors of cognitive process (*citta-vīthi*) are depicted in such enumeration of cognitive behaviors. For instance, while defining the behavior of the eye-consciousness process, *Paṭisambhidāmagga* illustrates several basic cognitive factors as performing the function of adverting (*āvajjana*), sense consciousness (*viññāna*), receiving (*vipākamanodhātu*), investigating (*vipākamanoviññānadhātu*), etc. In this process, the functional indeterminate consciousness performs the function of adverting to the visible object, eye consciousness arises at the eye door, the resultant mind element receives the object, and the resultant mind consciousness element investigates the object- “*katamā viññānacariyā? Dassanathāya āvajjanakiriyābyākatā viññānacariyā rūpesu, dassanaṭṭho cakkhuvīññānaṃ viññānacariyā rūpesu, diṭṭhattā abhiniropanā vipākamanodhātu viññānacariyā rūpesu, abhiniropitattā vipākamanoviññānadhātu viññānacariyā rūpesu*” (Taylor 79).

The commentary to the *Paṭisambhidāmagga*, the *Saddhammapakāsini* clarifies the meaning of the terminologies *āvajjanakiriyābyākatā*, *cakkhuvīññānaṃ*, *vipākamanodhātu*, and *vipākamanoviññānadhātu* that appear in this passage. According to the *Saddhammapakāsini*, *āvajjanakiriyābyākatā* is the function of consciousness that disrupts the *bhavaṅga* mind stream and adverts towards the sense object - “*āvajjanakiriyābyākatāti bhavaṅgasantānato apanetvā rūpārammaṇe cittasantānaṃ āvajjeti nāmetīti āvajjanaṃ*” (Joshi 292). The *cakkhuvīññānaṃ* is interpreted as wholesome or unwholesome resultant consciousness (*cakkhuvīññānanti kusalavipākaṃ vā akusalavipākaṃ vā*), the *vipākamanodhātu* is interpreted as wholesome and unwholesome resultant receiving consciousness (*ubhayavipākā sampācicchanamanodhātu*), and the *vipākamanoviññānadhātu* is interpreted as wholesome and unwholesome resultant investigating consciousness - “*vipākamanoviññānadhātūti ubhayavipākā santīraṇamanoviññānadhātu*” (Joshi 292) - arising in the sense door cognitive process.

In the mind-door process, the functional indeterminate consciousness performs the function of adverting for cognizing ideas. Here, the process of cognizing ideas as mind-consciousness is defined as the behavior of consciousness. The resultant mind element performs the function of adverting onto the object of cognition as a behavior of consciousness, and the resultant mind consciousness element occurs in the thought process which directs onto the ideas as a behavior of consciousness - “*vijānanathāya āvajjanakiriyābyākatā viññānacariyā dhammesu, vijānanaṭṭho manoviññānaṃ viññānacariyā dhammesu, viññātattā abhiniropanā vipākamanodhātu viññānacariyā dhammesu, abhiniropitattā vipākamanoviññānadhātu viññānacariyā dhammesu*” (Taylor 79). According to the *Saddhammapakāsini*, *āvajjanakiriyābyākatā* is interpreted as the mind-door adverting consciousness (*āvajjanakiriyābyākatāti manodvārāvajjanacittaṃ*) and then after, the *javana* consciousness succeeds by apprehending that mind-door object in the cognitive process - “*vijānanaṭṭhoti tadanantarajavanavasena ārammaṇassa vijānanaṃ eva attho, na añño*” (Joshi 292).

In *Paṭisambhidāmagga*, the term ‘*javana*’ appears in the meaning of impulsive consciousness for the first time before its systematic renderings in the commentarial literature (Cousins 43). The concept of *javana* consciousness is depicted in the enumeration of the behavior of unknowing (*aññānacariyā*). In *Paṭisambhidāmagga*, the behavior of unknowing is explained by showing the cognitive process where the consciousness performing the function of five-door or mind-door adverting (functional indeterminate adverting consciousness) precedes the impulsive consciousness that is rooted in greed or hatred, or delusion or other different kinds of mental factors arises in the process. For instance, the impulsion of greed for agreeable visible objects or hatred for disagreeable visible objects, or delusion for an object which is irrespective of either greed or hate is defined as the act of impulsion of greed or the act of impulsion of hatred or the act of impulsion of delusion and such mental processes are

the behaviors of unknowing (*aññānacariyā*) - “*katamā aññānacariyā? Manāpiyesu rūpesu rāgassa javanattāya... amanāpiyesu rūpesu dosassa javanattāya... tadubhayena asamapekkhanasmim vatthusmim mohassa javanattāya āvajjanakiriyaḅyākatā viññānacariyā; rāgassa ... dosassa... mohassa javanā aññānacariyā*” (Joshi 294).

In *Paṭisambhidāmagga*, there is a detailed enumeration of the act of apprehension consciousness (*javana citta*) associated with different types of mental factors and that originated from the six sense doors. Behavior associated with greed, hatred, delusion, conceit, wrong view, agitation, uncertainty, and the underlying tendency is enumerated as the behavior of unknowing. Opposite of these behaviors, the behaviors that are dissociated with such defiled mental factors such as non-greed, non-hatred, non-delusion, etc. are depicted as the behavior of knowledge. Similarly, the act of functional indeterminate advertent consciousness that performs the function of advertent to attain the stream-entry path, the fruition of stream-entry, the path of once-return, the fruition of once return, the path of non-return, the fruition of none-return, the path of *arhat*, and the fruition of *arhat* are the behavior of knowledge (Taylor 80-82). All such behaviors are enumerated as the act of impulsion (*javana*) that is preceded by the functional indeterminate advertent consciousness either in the five-sense door or the mind-door which has paved the way for the upcoming developed theory of cognitive process (*citta-vīthi*) during the commentary and sub-commentary period. Thus, *Paṭisambhidāmagga* seems to present the model of the cognitive process as a pre-mature form before it is fully developed during the Buddhaghosa period.

## Conclusion

There is no uniformity in the cognitive process models that are depicted in the *Sutta literature*. Various models have been found depicted in the original *Pali suttas* and the *Paṭisambhidāmagga* which is collected under the *Khuddhakanikāya*, but composed later than other *Suttas*. However, the pattern of cognitive process that is depicted in the entire *Sutta* literature is found conditioned to the *papañcasaññāsāṅkhā*, the process of complication and proliferation related to the sense object.

Generalizing the various cognitive process models in the *Sutta* literature some countable cognitive factors are found to play a role. These cognitive factors are consciousness (*viññāna*), contact (*phassa*), feeling (*vedanā*), perception (*saññā*), thinking (*saṅkappa/vitakka*), mental proliferation (*papañca*), craving (*taṇhā*), clinging (*upādāna*), volition (*cetanā*), examination of the object (*vicāra*), desire (*chanda*), diversity of passion (*parigraha*) and obsession (*pariḷāha*). Of them, factors such as consciousness (*viññāna*), contact (*phassa*), feeling (*vedanā*), and perception (*saññā*) are shown to commonly arise in every process, and the rest of the factors arise in the process of accomplishing the required mental functions. These factors are always in accord with a causal relationship largely so that all *puthujjana* have similar reactions and experiences in a particular situation.

It is found from studying the relevant *Suttas* that every model of mental process is the process of acquiring knowledge of the outer world and generating mental defilements in such processes as attachment, aversion, and illusion in this process. All these teachings are to encourage a rational understanding of the manner in how this process works and how a person can come out of the shackles of miseries that are entailed in this process. Each act of cognition is enumerated as a process beginning from a simple sensation and resulting in a discriminative apprehension of a sense object through the proceeding stages of cognition. Thus, the general order of the perceptual process from this study can be synthesized as follows:

Impingement of *Rūpa & Cakkhu* → *Cakkhuvīññāna*; Meeting of *Rūpa, Cakkhu & Cakkhuvīññāna* → *Phassa* → *Vedanā* → *Saññā* → Various Constructing Activities

## Conflict of Interest

The author declares that there is no conflict of interest regarding the publication of this manuscript.

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