

Chap-05:

Breakdown of the Unity of Phenomenal Consciousness

In the forgoing chapter we have discussed about the nature of the unity of phenomenal consciousness to establish the special characteristic of unity. This aspect of consciousness is not the whole picture of it and at the same time it opens the gate of the plausibility of breakdown of the unity thesis. There are some hints of its disunified nature discussed by some scholars. Focusing on this character of consciousness we will try to give a descriptive analysis of the same and finally we will show that this disunified character of consciousness does not stand against the nature of unity of consciousness.

The concern of this chapter is to show the different world of consciousness. This different world is the disunified character of consciousness. Apparently one may think that disunified character of consciousness will break down the unity thesis of the phenomenal consciousness. After descriptive analysis of the different examples of disunified consciousness, we will show that these examples of disunified consciousness do not stand against the unity thesis of consciousness. They are nothing but the contextual manifestation of consciousness. In this regard, we will analyse the case for phenomenal disunity within some different domains such as normal forms of consciousness, apparent motion or meta – contrast masking, anosognosia, schizophrenia, hypnosis, split brain syndrome etc. This work begins with the ordinary perceptual experience as evidence against the unity thesis.

5.1 Disunity in Daily Life -The microstructure of perception:

Let us begin with the considerations of the same perceptual event at different times. Human brain overcomes various problems by constructing a coherent model of its own way. It receives types of data from outside world at various levels. Sometimes information or data

about one and the same perceptual event at different times has been received by an individual. After receiving data by the relevant receptors, it is then synthesized before entering into consciousness. The time, in this connection, remains ineffective for across modalities or within a modality. Obviously, the various types of data received by relevant receptors require some times for processing. These considerations show that ordinary perception may not comprise with fragments of phenomenality. It is bound together to form phenomenal as a whole. So in the case of ordinary perceptual experiences, the stream of experience seems unified to introspection, but introspection has a coarse temporal grain.

Dennett, in his 'multiple drafts model of consciousness,' echoes the similar view. According to this view, 'there is no single, definitive "stream of consciousness," because there is no central Headquarters, no Cartesian Theater where "it all comes together".'¹ He draws a picture in the brain in which consciousness involves 'multiple channels in which specialist circuits try, in parallel pandemoniums, to do their various things, creating Multiple Drafts as they go'.²

Undoubtedly, the notion of colour phi and meta-contrast masking are there behind the theory of 'multiple-draft-model' pronounced by D.C.Dennett. Suppose, there are two small spots which segregated by a small visual angle and someone is looking at the spots. What will be the experience? Here, the subject will experience a peculiar thing that is the movement of the light from the first spot to the remaining one. Further, suppose that the first spot is orange and the second is blue. The moving point of the light appears to change colour from orange to blue at middle-point. At least, the report of subject's experiences is quite debatable and cannot be easily trusted. On the other hand, 'Meta-contrast masking is a species of backwards masking in which a target stimulus is masked by a subsequent stimulus on account of the contiguity relations between them'.³ In the meta-contrast experiment, the objective is a disk and the mask is a surrounding ring. As a result, the reports of the

objective's visibility have a U-shaped function. In a single word, subjects report that both the disk and the ring are visible if there is stimulus on the set asynchrony (SOA) between the disc and the ring is either very small or very large. But actually at intermediate SOA subjects report is either invisible or only partially visible. It should be kept in mind that the superficial differences between apparent motion and meta-contrast masking will disappear at the time of the presentations of perceptual objects. The so called differences do not stand against the present aim of the perceptual object as a single one.

Dennett makes a difference between two models of such phenomena: an 'Orwellian' model and 'Stalinesque' model.⁴ The Orwellian account of colour phi shows that at the time of experiencing of an orange spot the person always sees that his experience is followed by the experience of a blue spot. On the other hand, a 'revisionist historian of sorts' describes the matter from a different point of view. To them, movement of a single spot from one point to another indicates the colour which is changed on the mid-way as its flying paths. About meta-contrast masking, Orwellian account shows that the subject experiences a disc followed by a ring. Astonishingly, it seems that we simply experience a ring, in this case, as a single perceptual object. On the other hand, Stalinesque model considered these phenomena as a 'show trial' creating by brain before consciousness by a process of editorial revision. Here the remarkable difference between Orwellian account and Stalinesque views is based on the accuracy of the experience of the subject. The first one rejects the accuracy but the second one accepts it as accurate one.

Again there is a case of difference between the two views regarding the breakdown of the unity thesis in respect of perceptual experience. The breakdown within perceptual experience is clearly rejected by the Stalinesque, where as it is accepted by the Orwellian. Dennett thinks that the contrast between these two models is 'merely verbal'. In his own words:

‘The two theories tell exactly the same story except for where they place a mythical Great Divide, a point in time (and hence a place in space) whose *fine-grained* location is nothing that subjects can help them locate, and whose location is also neutral with regard to all other features of their theories. This is a difference that makes no difference.’⁵

Actually Dennett’s view, in this connection, is based on the analysis of data—both real data and imaginary data. According to Dennett, ‘.....account for all the data --- not just the data we already have, but the data we can imagine getting in the future’.⁶ But Bayne thinks in a different way. To him, ‘...even if the debate between these two accounts were intractable it wouldn’t follow that it is ‘merely verbal’ – that the two accounts would be merely notational variants of each other. This would follow only if we had reason to adopt a verificationist conception of consciousness –which we don’t.’⁷

However, Bayne assumes that the debate between these two models is substantive. Dennett proposes that ‘apparent motion involves a ‘misalignment’ between the temporal order of experiences and the experience of temporal order.’⁸For example, subjects’ has experience of the spot-as-blue first. Then she experiences of the spot orange turning to blue because any temporal order does not follow from the contents of these experiences. This model acts as a framework through which the difference between two accounts understood clearly. Both these models show that the temporal order of experiences is not arranged accordingly with the temporal order of their contents.

Here the main issues are related with the status of the representations of the experienced subject. The Orwellian maintains that consciously represents the location which is not revealed by light. On the other hand the Stalinist will not accept any conscious

representation of the stimulus. For this reason this contrast cannot be designated as ‘mere verbal’, rather it has a special force.

Bayne thinks that Dennett’s consideration about the debate between these two accounts is more justifiable in respect of intractability. He argues that psychologists neither accept the debate as intractable, nor is it an open one. Instead, the Stalinesque view explains both meta-contrast masking and apparent motion. Here we may follow the explanation gives by Bayne. He says, ‘Not only do researchers assume Stalinesque accounts of *these* phenomena, they also assume Stalinesque treatments of other phenomena that could in principle be accounted for in Orwellian terms.’⁹

Bayne thinks that there are sufficient reasons to adopt the Orwellian position because the degree of ‘masking’ appears in meta-contrast research leads how awareness of the objective is *measured* rather than by changing the stimuli and SOA. In this typical experiment, subjects needs to say whether or not the objective was there. This study shows that the U-shaped function reported the awareness of the objectives at low and high SOA. So, it is understood that U-shaped function generally is not appears when the subjects are directed to respond in some alternative way – ‘by being told to ‘hit a button as soon as anything appears’.¹⁰ Bayne identifies it as the ‘meta-contrast dissociation effect.’

We can explain the meta-contrast dissociation effect following Ansorge and his colleagues. On the basis of their studies, it is said that the U-shaped function is different from non-U-shaped performance in the following ways: First-U-shaped functions requires subject to produce verbal responses whereas the latter is a non-verbal motor responses, such as pressing a button. Secondly, subjects are required to report the stimulus in standard studies, but non-standard studies leads the subjects to consider the stimulus as responding element rather than to make a judgment. In a single word, the difference between U-shaped and non-

U-shaped performance is actually the difference between output mode (button press vs. verbal report), and the difference between task mode (responding vs. reporting). On the basis of their study, they found that output mode had no effect on subject's awareness of the target, but the meta-contrast dissociation effect is fully explained by the differences in task mode.

However, the reliability of this result depends on an assumption that the structure of consciousness will not be changed across responding /reporting and speeded/ unspeeded trials. These pre-suppositions also avoid all kinds of possibility to be probe-dependent of consciousness. Further, if consciousness is treated as probe-dependent, then the subject's experiences of the objective depends on tasks modes. In the case of speeded trials subject's has no sufficient time to analysis the nature of the stimulus. First the visual system 'instructed' to form an explanation, then, it comes to a visual experience of the target. This is designated as conscious representation of the objective/target. In the case of unspeeded trials, the visual system has no such problem. As a result, it fails to mention the target. The same is true in the case of dissociation between responding trials and reporting trials. On responding trials, perception is primary to originate an experience on the basis of its 'initial take'. On the other hand in reporting trial, perception is generated on the basis of its 'higher – processes'. Simply put, one's multiple experience of the world depends on the 'instructions' given by the visual system. This is known as probe-dependent version of Stalinism.

Dennett provides an 'anti-realist' account which introduces the thought that consciousness is probe-dependent. In this thought, he wants to show that the nature of consciousness is ascertained at the stage of temporal clarity. By contrast, Tim Bayne provides a realistic approach where he shows that the nature of the subject's experience is a function of probe-involving facts. Obviously this is determined by nature: 'given how a subject is (or expects to be) probed on a particular trial, there will be a corresponding fact about what they experienced on that trial.'¹¹

We can reply to Stalinesque treatments of ‘the loop objection’, raised by Dennett, mentioning the colour phi phenomenon. In colour phi phenomenon, we have seen that there can be a delay of up to 200 milliseconds between the two stimuli. This account raises a problem from the Orwellian perspective. They claim that visual system of a receptor produces a visual experience of orange light first and then it received information about the green light. So, it indicates that a ‘show trial’ may be there in reality. It also proves that perceptual experience takes an important role for the guidance of actions.

In response to loop objection, it is said that perceptual experience plays a key role in the on-line guidance of action. The objection assumes that in all cases of ‘delay loop’ the perceptual experiences might remain invariant. However, such assumption arise another problem. The criteria of the delay loop depend on the speed and perceptual content of the particular context. We can therefore accept Stalinism without any perceptual delay of contents. Orwellian models of the meta-contrast masking and colour phi are odds for the unity thesis. It is true that at the time of finding evidence of disunity within perceptual experience, we find some coherent conceptions about the world. Perceptual systems may appear as shelter of ‘multiple drafts of narrative fragments’ but those drafts are not effective in connection with the consciousness.

The emergence of thought:

Another putative example of breakdown of unity thesis within phenomenal consciousness can be provided from the perspectives developmental psychology. Child’s unity of thought and action emerges generally from their first year of life. They (children) are not only agents, but they are completely integrated agents. We suggest three different paradigms which will show that children’s conscious thoughts are not bound together within a single stream of consciousness.

Let us go first with Piaget's (1954) famous experiment of the task 'A –not –B'. In this experiment, the child watches a toy which is hidden in one place (A). After a few minutes, he/she is allowed to take it. Again the toy is hidden another place (B) and the child is again allowed to go for it. We have observed that she will go for it at place A rather than B, though the changes of place of toys have been done in the presence of his/her. Astonishingly, in this experiment, child's looking behavior is *more* perfect than their reaching behavior. In Adele Diamond own words, - 'infants appear to be telling us with their eyes that they know where the toy is, but their hand goes to the old place anyway'. ¹²

The second experimental paradigm is connected with the deployment of rules. The dimensional change and a card-sorting task are the fundamental elements of this experiment. In this experiment a child requires to sort a series of cards based on one dimension (say colour). After that the children are told about the changes mode for this purpose (e. dimensional change). They were directed to sort the card according to a second dimension (say shape). The result is that three year old infant will be able to report about the new rule though they continue to sort the cards following the first rule. Their verbal behaviour encouraged current rule whereas their sorting behavior suggested the past. The same deployment is found in the behaviour of patients whose pre-frontal part of brain is damaged.

The third paradigm is concerned children's with the appreciation of others' false beliefs. For example, a child watches an object in one location. The person who places the object changes the scene. The object is moved to second location. Third person moves the object to another location (any almirah). In absence of the protagonist, the child is asked to report that, in which place, the protagonist will search the object. Obviously, under 4-yr old children will say that the protagonist will search the hidden object where it is rather he would believe, it to be on the cupboard. On the other hand, children over 4-yr. old will say that the

protagonist will search the object where she last saw it. This result shows that children under 4-yrs lack the ability to ascribe false beliefs to other agents in a reliable manner.

Another experiment has been conducted by Clements & Perner (1994) in the false belief context. They conducted their study only on 3-yrs old children's eye movements in regard to false belief. They conclude that the verbal reports of children will be different from what they look and what they manifest.

The above paradigm is the reliable evidence of phenomenal breakdown in consciousness. In all these cases, children's simultaneous conscious states are not included within a single stream of phenomenal consciousness. It may be that children's in the A – not-B task have two different conscious representations – one is where they reach and another is where they look. Similar may be said in other two cases. From their experiments, the proponent of this view shows two kinds of failure of unity - access unity and representational unity involves here.

Bayne thinks that there are three reasons involved in behavioural dissociations in the case of disunity. He explains this matter with help of switching model in respect of a child. There he shows the matter in three steps. First, he says that it is hard for child to make the switch from A to B when she is associated with A. Secondly, infants no longer make the A – not – B error when they notice the object being hidden at location A-and are not provided to search for it until it is hidden at location B. Lastly, the infant will reach for the object at the correct location having failed to find the object at A. So it is clear that infants may be aware of the object's true location but they are unable to prevent the prepotent response to reach towards a location that has delivered the good.

Bayne argues that inhibitory difficulties may be the cause of the above discussed dissociations but it does not prove the breakdowns of the unity of consciousness. There is no

doubt that inhibitory failures of various kinds are so common in our everyday life. Inhibitory failures involve a breakdown of 'the unity of agency' but they are not relating to the split of the unity of consciousness. It is not the case that such agents have conscious thoughts or intentions that contained within a different stream of consciousness. Rather, such agents have lost awareness of their goals or they are unaware of what they are doing.

Minimally responsive patients:

Another putative example for fragmentation of consciousness is found in the context of global impairments to consciousness. In this case, there is no normal feature of subject's 'background state' or 'level' of consciousness. Here we will continue our discussions to two cases; the vegetative state, the minimally conscious state and the epileptic absence seizures patients where the fragments of consciousness might be involved.

The vegetative and minimally conscious states:

One may infer the breakdown of unity of consciousness in a vegetative state patient. Patients, who are suffering from a major head-trauma or hypoxic – ischaemic brain damage in a certain time is called a vegetative state of the patients. All the general symptoms of these patients appeared as negative and there were no evidences of self-awareness or responses to external stimuli. Even there is no evidence of language expression. Vegetative state patients have different kinds – persistent vegetative state and permanent vegetative state. A persistent vegetative state patient belongs for a certain period of time in a vegetative state. On the other hand, permanent vegetative state patients belong for longer –near about twelve months after a traumatic brain injury and near about six-months after – a – non-traumatic brain injury. When a patient recovers from the vegetative state gradually but not completely– is designated as the minimally conscious state. There is an important difference between the vegetative state and the minimally conscious states. In the vegetative state, patients are suffering from headtrauma

and lose their consciousness, but in minimally conscious states, patients recover their consciousness partly through an unstable and fluctuating affair.

Epileptic absence seizures:

Some theorists who claim that consciousness may breakdown; they mention the case of epileptic absence seizure patients. Such patients appear to be ‘absent’ or disengaged from their present environment, fail to respond to question or commands etc. Absent mindedness may occur in both partial seizures and generalized seizures. Partial seizures arise in a limited area of the temporal lobe of the brain. On the other hand, generalized seizures pervade the regions of the entire brain. The periods of generalized seizures occur for a very brief span of time (lasting for 5-10 seconds) whereas partial seizures can exist up to four minutes. In conclusion, it can be summarized that the epileptic seizure patients lose their consciousness for some times. It can also be said that they fail to respond to questions in some cases but it is also true that their capacity to produce verbal responses is more disrupted than their capacity to read or count aloud. Both of these capacities indicate a breakdown in the capacity to encode items in the short-term memory. In all cases, consciousness breakdown only on the basis of actiology and cognitive profile of the concerned patients.

5.2 The Hypnosis:

Marquis de Puysegur, the student of Anton Mesmer was the first investigator who profounded the structure of consciousness in hypnosis. In his *Memoirs* (1784), he identifies the hypnotic state in which the ‘second consciousness’ is involved. Alfred Binet, in his books – *Double Consciousness* (1889 -1900) and *Alterations of Personality* (1896) argues that the ‘double consciousness’ found in hypnotic phenomena through a challenge against the existence of transcendental ego. Both William James and Morton Prince emphasized on the view that in the case of hypnosis and automatic writing, consciousness may breakdown into parts ‘which

co-exist but mutually ignore each other.’¹³ On the other hand, recent neuroscientific research work centered on hypnosis claims that hypnosis state of a patients, unity of consciousness may split. So the difficulties of hypnosis state of concern individuals mainly depend on the concept of so-called ‘hidden observer’.

The notion of ‘hidden observer’ has its sources in automatic writing. We can mention an example following William James:

‘A young woman who had been writing automatically was sitting with a pencil in her hand, trying to recall at my request the name of a gentleman whom she had once seen. She could only recollect the first syllable. Her hand meanwhile, without her knowledge, wrote down the last two syllables. In a perfectly healthy young man who can write with the planchette, I lately found the hand to be entirely anaesthetic during the writing act; I could prick it severely without the Subject knowing the fact. The *writing on the planchette*, however, accused me in strong terms of hurting the hand. Pricks on the other (non-writing) hand, meanwhile, which awakend strong protest from the young man’s vocal organs, were denied to exist by the self which made the planchette go.’¹⁴

The automatic writing is the best example of hidden observer. These hidden observer experiments have multiple features. Here the subject is hypnotized and informed that he/she is agnostic for stimulus such as pain producing ice water. The hidden observer induction model is given by the subject.

‘When I place my hand on your shoulder, I shall be able to talk to a hidden part of you that knows things that are going on in your body, things that are unknown to the part of you to which I am now talking. The part of you to which I am now talking will not know what you are telling me or even that you are talking.’¹⁵

The Hidden observer induction clearly explains that the subject describes the stimulus some particular ways. From these experiment, a 'hidden part' has been found within highly hypnotizable subjects. Surprisingly, the subject's normal reports shows the agnostic state of patients due to cause of stimulus whereas their hidden observer reports will proposed a level of awareness of the stimulus same as the one in the reports of hypnosis which is produced without agnosia. Theorists of late nineteenth century accept them as evidence of a 'secondary' or 'double consciousness'. They characterized it as a dissociated, separate stream of experience.

However, some opponents claim that there are two streams of consciousness at one and the same time in the hidden observer subjects. These are – i) a 'central' stream, ii) 'hidden' stream. The subject's 'overt' report is caused by a central stream; by contrast the 'covert' report is caused by a 'hidden stream'. Tim Bayne calls this the '*two streams model*' of the hidden observer. Prince, like other contemporary researcher expresses the mental states underlying hidden observer reports as unconscious. This is call *Zombie model*. Now we will try to discuss the concept of zombie model in befitting manner.

The Zombie model

The notion of 'hidden observer' is first explained by Hilgard's work in different terms. He describes it as a 'hidden consciousness'. He proposes that the 'hidden observer' is 'a metaphor for something occurring at an intellectual level but not available to the consciousness of the hypnotized person'.¹⁶ Bayne endorse it as the *Zombie model*.

Hilgard's point out that the main foundation of zombie model involves in the claim that 'hidden observer 'reports' are not really reports'¹⁷ because, the subject does not make hidden observer 'reports'. They do not provide any evidence about their conscious states. As a result, we consider them as created by the unconscious representation of stimuli.

Bayne does not agree with this view because the hidden observer behaviours definitely seem to be reported. Further it is not clear about the producer who produces such reports without hypnotizing the subject. However, it is difficult to distinguish between hidden observer or 'covert' reports and 'overt' reports. One cannot distinguish the two by appealing to the motor systems employed. Neither they can differentiate between hidden observer reports via button pressing, automatic writing and 'automatic talking', nor can they distinguish hidden observer reports from overt reports. They never can say that the first occur after the second. Some theorists claim that hidden observer reports and over reports are given simultaneously. They also opine that observer reports always do not happen spontaneously. Bayne maintains that spontaneous reports generally are not always coded as hidden observer reports. Bayne holds the view that hidden observer qualifies as a genuine report though it might be prompted or not.

Freud' gives another argument in favour of the zombie model. He thinks that zombie model possess secondary stream of mentality. He states the second consciousness as 'scarcely preferable' by purely unconscious processes. He also opines that the zombie model is more attractive than the two streams model. Bayne maintains that Freud's argument is not as plausible as Hilgard's. According to him, the flaw of Freud's arguments involves with the claim that the subject of the second consciousness does not know anything about the 'unconscious consciousness'. This argument is plausible in the sense that in the subjects' preliminary consciousness there is no unambiguous knowledge of the mental states of secondary consciousness. By contrast, subjects possess directly with those mental states that appears within their own stream of consciousness. This argument implies the fully unknowability of secondary consciousness – which is not an appropriate understanding of this argument. According to Bayne, two stream theorists emphasizes on the strong third person perspectives for ascribing a secondary consciousness to oneself.

He maintains that the most acceptable evidence for the Zombie model depends on the feature between the different forms of normal behavioural control and hidden behaviours. In a representative work of a sentence test, Bargh et al observes that half of the participants give the stereotype answer containing words; other half of the participants tries to give response with sentences containing only age neutral words. They never try to give response the unscrambling task. On the basis of their study, Bayne concludes that 'if we were tempted to assimilate hidden observer behaviour to the kinds of unconscious behavioural modulation found in Bargh's study, we would still be forced to ascribe conscious states of some kind to the hidden observer.'¹⁸

The supporter of the zombie model developed their concept of hidden observer behavior on the basis of different pathologies of consciousness. They mention the case of epileptic absence seizures patients in this context. Bayne argues that such patients are not actually conscious because they possess some kind of deficiency in their ability of conscious reflections. Furthermore, it is said that certain kinds of cognitive control appears outside the consciousness. As a result, unconscious states guide the kinds of behavior found in hidden observer contexts. Bayne opines that cognitive unconscious is comparatively smart. To him, goal directed behavior is the most reasonable to reject the zombie model. It helps to obtain consciousness to a creature. So, any agentic criterion is unnecessary to deny the proposed Zombie model.

The two-stream model:

It is generally said that the hypnosis patients and split brain patients enjoy two streams of consciousness. The two-stream model is that such patients have two streams of consciousness. It is claim that hypnosis can lead to sudden changes in the contents of consciousness of the individuals. The hypnosis patients insert uncommon experiences into the

stream of consciousness. He also removes ordinary experiences from the stream of consciousness. It should be noted that there is a difference between the contents of consciousness and the structure of consciousness. Hypnosis changes the contents of consciousness rather than the structure.

The evidence of the two stream model is that the hypnotized subjects easily report a reducing sense of agency for action exhibited as the result of hypnotic suggestions. Two streams theorists are ready to explain that hypnosis has split the subject's 'central executive', jointly with their stream of consciousness into two different effective systems. Most of the cases, the subject's sense of agency is not reportable for some obscure places to the 'hidden' part of their consciousness. The sense of agency is designated as 'phenomenology of agency'. Obviously, a question arises what should we make to overcome from this 'phenomenology of agency'. A general response against this 'phenomenology of agency' argument may be given on the basis of dissociated control account of hypnosis. According to this account, the subject's reducing sense of agency for hypnotic activity highlights the fact that hypnotic suggestions avoids the executive agency wholly. By contrast dissociated control theorists should not look forward a hypnotized subject to experience a sense of agency. However, executive control is not involved within the hypnotic actions. They are associated with the sense of agency.

Bayne does not think such response as fruitful because the deficiency of agentic experience is a common feature of hypnotic responding. This is not actual case. Actual case is that the deficiency of agentic experience associated with definite actions. Overall, experience of agency has been lost by hypnotic subjects for executive actions. For example, subjects can be persuaded to 'forget' their concept of the alphabet 'D'. They will utter A, B, C, E, Fand so on. Such behavior will be treated as executive by anyone's lights.

Bayne thinks that there is no reason to accept the arguments concerning the phenomenology of agency because such argument depends on an erroneous assumption that actions must be associated with the experience of agency. The phenomenology of agency itself is not inevitable accompanied by agency. He opines that the hypnotic proposal has simply taken off the subject's sense of agency during the leaving intangibility of the subject's capacities for executive agency.

According to Bayne, the phenomenology of agency argument unable to captured the real phenomena for its wrong assumptions that 'actions must be accompanied by an experience of agency'.¹⁹ Here the essential association is not necessary between the phenomenology of agency and experience of agency. Bayne maintains that 'the hypnotic suggestion has simply removed (or at least dampened) the subject's sense of agency whilst leaving untouched the subject's capacities for executive agency'.²⁰ In a word, hypnotized subjects are unable to report a sense of agency for some cases because it remove from their experience entirely.

Another argument in favor of the two-stream model is given by Martin Orne's notion of so-called 'trance logic'. He claims that some states involved in hypnosis, are described by the 'apparently simultaneous perception and response to both hallucinations and reality without any apparent attempts to satisfy a need for logical consistency'.²¹ For instance, the 'duality reports' of age-regressed subjects point out that they are not aware of any inconsistency between the experience of themselves as both a child and an adult. It may be that such subjects do not require to solve the problem between two experiences because they can be found within various streams of consciousness. So we can say that there one kind of representational disunity might be involved.

5.3 Anosognosia :

Like other pathological disorder related to the dissociation of the unity of consciousness, opponents of unity thesis also mention some other clinical dis-orders like anosognosia, schizophrenia etc. where concern individuals is not aware of their primary changes in the contents of their own conscious states. We will begin our discussion with anosognosia. In anosognosia, many symptoms such as deafness, paralysis, prosopagnosia and aphasia may arise in the person's normal life. In this case, they are not aware of their behavioural and physical damages of the state and also their own conscious state. According to Motivational accounts of anosognosia, patients are aware of their damages state but deny to acknowledge them because their extremely strong consequences. One limitation is there in the selectivity of anosognosia in respect of motivational account. Here, patients deny about their hemianopia (blindness in one half of the visual field) but they confess about their hemiplegia (paralysis on one side of their body). By contrast, some other patients confess about their hemiplegia but deny about their hemianopia.

The second version concerning anosognosia involves one kind of damaging state of awareness. This kind of damaging state is restricted to the encoding and recovered of information in memory. According to this account, patients are conscious of their damaging state of mental condition when their behavioural consequences are clearly understood, but it fails to make any influence on their long-term beliefs on their physical abilities. In support of their view, they mention the case of epileptic patients who has the experience of Wada procedure in preparation for temporal lobe surgery. In this study, they find that most of the patients are not able to remember their previous experiences about their ability in one half of their body.

However, all these experiments concerning anosognosia are one kind of pathological experiment of consciousness. Such experiments do not prove the existence of the unity of consciousness. Some theorists like E. Bisiach (1988) and A. Berti (1995) maintain that they find a breakdown of phenomenal unity in anosognosia. According to them, -“different mental states or events, although being individually endowed with phenomenal quality, are kept separate from one another within the stream of consciousness.”²² Bayne maintains that certain components of patients stream of consciousness dissociate from each other for their ‘self-blindness’ to their damaging state of mental condition but it does not prove the phenomenal disunity of anosognosia. He argues, following Bisiach that, anosognosia may provide some evidence for domain specific account to introspection. In anosognosia, damage of certain modules lost their ability to detect the damaging state rather than the fact that it lost the individual’s capacity to identify the perceptual or sensory representations in a definite domain.

5.4 Schizophrenia:

There is another aspect of consciousness that goes against the unity thesis of consciousness. This is called the case schizophrenia. Some thinkers, like Kraepelin (1896) think that the unity thesis of consciousness gets its blow to break into pieces by the explanation and functions of neurotic diseases called schizophrenia. Generally, it is said by the neurologist that the patients of schizophrenia have a splitting consciousness in respect of their live experiences, presentation of thoughts etc. The effects of schizophrenia diseases do not fit with the theory of unity thesis as described by Bayne. So here again we have to face a debate between splitting theory of consciousness based on schizophrenia and unity thesis of consciousness based on explanation given by Bayne. At first we will dwell upon the fact of schizophrenia to focus upon its points and corners and we will show the possibility of the claim

of some neurologists that it offers unbridgeable gap to establish the unity thesis of consciousness.

Some commentators, like Kraepelin (1896) think that the absence of the unity of consciousness is the core feature of the disease schizophrenia. It is a complex and heterogeneous disease. It is said that the symptoms of schizophrenia bunch into two symptoms -positive symptoms and negative symptoms. The positive symptoms are described by an excess of affect and thought. By contrast, the negative symptoms involve lack of affect and thought like lack of poverty of speech (alogia) and motivation (avolition). In the case of schizophrenia, structure of consciousness is mainly restricted in two primary symptoms – namely, thought disorder and thought insertion.

Thought disorder is nothing but the inability to structure of action and thought. Bayne thinks that thought disorder is not a real barrier of the unity thesis. It is not the case that patients have different conscious states that are not constituted within an overall phenomenon field. We might call this thought disorder as ‘narrative unity of consciousness’. It manifests the capacity to keep one’s thought on the right way. But narrative unity is not identical with phenomenal unity. The unity thesis is only related with the phenomenal structure of consciousness. So the thought disorder does not prove the breakdown of phenomenal unity of consciousness.

Another positive symptom is ‘thought insertion’. The key feature of thought insertion is one kind of mental fragment. Karl Jaspers, one kind of mental fragmentation is the key feature of the thought insertion. Karl Jaspers, one of the leading psychologists, describes thought insertion in the following manner:

‘Patients think something and yet feel that someone else has thought it and in some way forced it on them. The thought arises and with it a direct awareness that it is not

the patient but some external agent that thinks it. The patient does not know why he has this thought nor does he intend to have it. He does not feel master of his own thoughts and in addition he feels in the power of some incomprehensible external force.²³

Some theorists think that thought insertion possess a lack of sense of subjectivity or 'myselfness'. According to this view, patients forget that they are denying their own thoughts which they are introspectively aware. Also thoughts that occur in their own stream of consciousness are theirs. We find a similar view in Freud's description of thought insertion in which 'portions of [the patient's] mental life - his perceptions, thoughts, and feelings - appear alien to him and as not belonging to his own ego'.²⁴ This account is known as '*no-subjectivity*' account.

We find another view concerning the thought insertion where patients are not only the *subjects* of the thoughts, but also merely they are *the agents of* those thoughts. This is known as 'no-agency' model.

However, there is a great debate between the no-subjectivity account and no-agency account which are more relatively comprehensible. Bayne thinks that both accounts do not quote any barrier on the unity thesis. Although thought insertion allows the new aspects of the unity of consciousness, yet, it has not any kind of bearing on phenomena fragmentation. Also it may be that the aspect of the unity of consciousness is lost or at least compromised by one kind of experiences that are one's own. Bayne claims that such form of the unity of consciousness does not entail the phenomenal unity of consciousness. Again we can say that certain forms of the unity of consciousness may be revealed in schizophrenia, but it is not compatible with such kind of unity in which we are interested.

5.5 The Split Brain:

It is thought that the split brain syndrome is one of the important challenges to unity thesis of consciousness. Now we want to deal with nature and function for split brain. We will discuss the possibility of the retention of our long cherished thesis of unity of consciousness by overcoming the challenge thrown by the split brain phenomena.

A well-known fact is that discussions on the unity of consciousness since the late 20th century have centred on the ‘split-brain’ operations. First performed on humans by Van Wagenen and Harren (1930), it involves the severing of the corpus callosum to prevent epileptic seizures spreading from one hemisphere to another. Their procedure remained unsuccessful and abandoned till successfully resurrected by Vogel and Bogen, and though effective it remains as a last resort for treating epilepsy.

Despite the operation, patients, according to Bogen, displayed ‘social ordinariness’ and early researchers were surprised by the apparent lack of cognitive impairment due to the operation. The split-brain case against the unity of consciousness is not derived from the daily behaviour of split-brain patients but comes from the cognitive and behavioural disunities exhibited by them in carefully controlled studies. These studies are used by commentators to prove the fact that split-brain patients no longer enjoy a unified consciousness.

Split-brain studies have mostly been drawn from eleven patients; 6 from Caltech series and the rest from Dartmouth and the procedure performed on the Caltechs is known as ‘commissurotomy’ which involves removing the corpus callosum along with the massa intermedia of the thalamus. The other procedure, known as ‘callosotomy’, removes only the corpus callosum. The difference between the two types of patients is not pronounced and they are all split-brain patients. The important division is between patients in whom the anterior portion of the corpus callosum has been sectioned versus those in whom only posterior

portion of the same have been severed – resulting in behavioural differences. The former exhibit classic split-brain syndrome, while hemispheres the latter show only minimal dissociations.

The split-brain syndrome is most clearly revealed in controlled experimental conditions and the experiments show how the information is processed by only one hemisphere. The tachistoscopic presentation which requires the patient to maintain a central focus while information is flashed in a hemi-field long enough to be registered but short for eye movements. The contralateral structure of the left visual field (LVF) and the right visual field (RVF) of the visual system ensures that stimuli projected on LVF are processed in the right hemisphere and vice-versa. Other sensory perceptions also respond in a similar fashion. These experiments reveal two kinds of disunities of the split-brain syndrome: *representational* and *access disunities*.

Representational disunity involves a lack of integration and inferential promiscuity in the contents of the patient's mental states. For example, a patient might be aware that his LVF contains the numeral 9 and his RVF contains the numeral 6, but can be unaware of which hemi-field has the higher numeral. Access disunity occurs when the contents of the patient's conscious states are not available to the same range of consuming systems. Generally speaking, information presented in the RVF will be unavailable for left-handed grasping behaviour while information presented in the LVF will be unavailable for verbal report.

The precise nature of these unities varies within patients. Where one patient might name LVF stimuli but cannot compare stimuli presented to two halves of his two visual fields, another might be able to compare stimuli across her two visual fields but cannot name the LVF stimuli. This is a classic split-brain syndrome indicating the structure of consciousness in the split-brain. The first question is whether both left-hemisphere (LH) and

right-hemisphere (RH) representations are conscious. Some confirm that only the patient's RH is conscious, while the 'non-speaking' LH is unconscious and the behaviours it generates are produced by 'zombie mechanisms'.

There are intimidating problems for this account of split-brain; though speech production is generally lateralised to the LH, certain split-brain patients (P.S., V.P., L.B., J.W.) have capacity for both LH and RH speech production. Linguistic production and linguistic comprehension must not be a precondition on the possession of consciousness. Such a principle would remove pre-linguistic children and aphasics from the realm of consciousness. If a subject capable of verbal report cannot verbally report the contents of state P, then state P is not a conscious state – even this principle is problematic. The RH guided behaviour in the split-brain is a possible counter-example to the claim that the contents of the consciousness must be verbally reportable.

The zombie model cannot be defended by establishing a parallel between the RH behaviour and the unconscious motor control, because the link is quite weak. Normal subjects demonstrate motor control outside of awareness by remaining aware of the stimulus – merely the awareness of the *response* to the stimulus is lost. In cases such as blind sight, the subject is not conscious of the stimulus, but is conscious to the response to it. The split-brain case is unique, where the subject remains unaware of both the stimulus and his response to it.

Summarising an experiment testing the RH based abilities of split-brain patients, with LH language, Sperry writes that the level of the RH's ability to identify test items and also the quality of the accompanying emotional and evaluative responses were approximately similar to those obtained from the RVF and LH. The basic problem with the zombie model is that split-brain patients can produce complex goal-directed behaviour under RH control. A patient in a persistent vegetative state can emerge from it if he can perform actions that are as purposeful and environmentally sensitive as those performed by split-brain patients under RH

control. So both LH and RH in split-brain can support consciousness, bringing in the ‘positive moment’ in the argument for disunity.

The dominant view within both neuropsychology and philosophy is that even the ‘negative moment’ can be met. Most commentators state that there are times when the split-brain patient has disunified conscious states. These are *disunity accounts* of the split-brain; within which find *two-stream accounts* and *partial unity accounts*.

Two-stream account state that conscious states that a split-brain has at any one time can be assigned to one of two non-overlapping sets where the members of each set are mutually unified but no member of either set is phenomenally unified with any member of the other set. The two-stream model is the received account of the split-brain syndrome. The partial unity account holds that consciousness in the split-brain has a branching structure: patients have simultaneous experiences (e_1 , e_2 and e_3) such that e_1 and e_2 are phenomenally unified with e_3 , but not with each other. Lockwood first presented the partial unity model of split-brain explicitly.

Both the models, two-streams and partial unity, disagree with the unity thesis, because both suggest that there are times when patients’ experiences are phenomenally not unified with each other. These models can be reconciled with the unity thesis by rejecting the identification of subjects of experience with organisms. Neo-Lukens identify subjects of experience with psychological networks or intentional systems. The truth of phenomenal disunity treatments of the split-brain does not indicate the end of the unity thesis, because, maybe, severing the corpus callosum not only splinters the patients consciousness but may also create multiple, and perhaps overlapping, subjects of experience.

In Case for disunity the two-streammodel and partial unity model commonly claim that split-brain patients are phenomenally disunified, sustaining the ‘negative moment’. Three

arguments can be considered for thinking that split-brain patients have phenomenally disunified conscious states.

1. The Argument from agentive disunity:

Though split-brain patients usually display a high degree of agentive unity, in certain cases this is challenged. One such case of agentive disunity is inter-manual conflict where the anarchic left hand tries disrupting the efforts of the right hand, eg; anarchic left hand of the patient tries to interfere with the right hand's attempt to button the shirt. Most common in weeks immediately after surgery, anarchic hand behaviour subsides after a few months. In spatial decoupling, although cognitively intact subjects find it difficult, for instance, to draw a square and a circle with each hand (simultaneously drawing distinct spatial patterns, i: e), a split-brain patient have no such difficulties. This is also a kind of agentive disunity.

Neither inter-manual conflict nor spatial decoupling support split-brain patients as phenomenally disunified. The behaviour of anarchic hand is triggered by stimulus-driven intentions where seeing a button triggers a strong response to undo it. The intention might be triggered by a conscious perception of the stimulus but the subject maybe unconscious about the intention. Sometimes, while navigating crowded streets while engaged in a conversation, for example, we too might be unaware of stimulus driven intention. In spatial decoupling (consistent with phenomenal unity) motor independence involves only subconscious mechanisms. Though split-brain patients only produce *spatially* decoupled actions, not *temporally* decoupled actions. Each of the two hemispheres, though able to process perceptual information autonomously, yet they are not able to select motor responses independently and simultaneously.

In the 'cross-cuing' phenomenon, the split-brain involves inter-hemispheric cooperation, rather than conflict, where the patients use environmental cues to transfer information between hemispheres. A patient may run a fingernail down the teeth of a comb,

making a characteristic noise to help identify the object. Using the common perceptual space, the RH attempts to cue in the LH by visually fixating on a related object. Cross-cuing can also be mediated by head or tongue movements, sub vocal speech, and various forms of imagery. The two hemispheres are like distinct agents intent on securing a common goal.

Cross-cuing should not be modelled on inter-subjective communication, because in cross-cuing the cuing hemisphere does not take itself to be communicating with another agent nor does the receiving hemisphere think of itself as the recipient of a communicative act. Although there is some evidence that split-brain patients may have distinct RH and LH self-conceptions there is no evidence that each of the patient's hemispheres considers itself or its neighbour as an autonomous locus of agency.

We cannot be forced to model cross-cuing on inter-subjective communication just for account going. There are two alternatives to the communicative conception of cross-cuing. Firstly, cross-cuing can be modelled on information transfer between sub-personal homunculi in decision-making or memory retrieval. Next, cross-cuing can be seen as a technique by which the *patient* tries to manipulate his own mind. Like we use various methods to revive our memory, similarly split-brain patients use various tricks to transfer information between the two hemispheres. Split-brain patients may have significantly less agentic unity than normal subjects, but we cannot conceive of them as 'composites' of two conscious agents.

Representational disunity argument:

Some argue that the lack of representational unity between left hemisphere and right hemisphere representations indicates phenomenal disunity. Let us consider a split-brain patient (S) in the key-ring experiment following Bayne:²⁵

- a) S simultaneously experiences the content <'key'> and also the content <'ring'>.

- b) Subjects simultaneously experiencing <'key'> and <'ring'> that are phenomenally unified with each other will also have an experience with the content <'key' & 'ring'>.
- c) S does not have an experience with content <'key' & 'ring'>.

Therefore,

- d) S's experience of 'key' and 'ring' are not phenomenally unified.

In this argument, the premise (1) is safe because if S is conscious of both words then she is conscious of them as simultaneously. The second premise is also true because it follows from Representational Integration Principle (RIP) which I have mentioned before. The third premise also reasonable because if S has no such experience then S obviously have no evidence of an experience of <key-ring>. So the first three premises are seemingly specious as individual and they implies the phenomenal disunity of phenomenal consciousness together. In this regard the proponent of disunity of phenomenal consciousness claims that the representational disunity argument is free from all anxiety.

The access disunity argument:

Another argument concern the access disunity argument proves the phenomenal disunity. This argument built on the relationship between access unity and phenomenal unity. Let us consider again a split-brain patient (S) in the key-ring experiment following Bayne:²⁶

1. S has, simultaneously, an experience with the content <'key'> and an experience with the content <'ring'>.
2. If simultaneous experiences of <'key'> and <'ring'> are phenomenally unified with each other then they will be access unified: their contents will be available to the same range of consuming systems.

3. S's representations of 'key' and 'ring' are not access unified: although the contents of both states are available for high-level consumption, they are not available to *the same* consuming systems.
4. So, S's experiences of 'key' and 'ring' are not phenomenally unified.

In the above argument, the first premise is nothing new. This argument is identical to that of the previous argument, but 2) and 3) are different. 2) appeals to Conjoint Accessibility Principle (CAP), which says that for any pair of simultaneous experiences e_1 and e_2 , if e_1 and e_2 are phenomenally unified, then, *ceteris paribus*, their contents will be available to the same consuming systems.

So, in the above discussion, we have noticed that split brain patient's demands the apparent disunity in phenomenal consciousness, though Bayne does not think such argument as decisive. It is true that the possibility of the operation in brain throws a challenge to the unity thesis of consciousness. Medically it is proved that the patient in the post operational period can lead a normal life post operation though at the cognitive level he faces some problems. That means, there is a chance of split-brain or discontinuation in consciousness. Since it does not prove that the split brain patient has two different streams of consciousness. 'The split brain case against the unity of consciousness derives not from the everyday behaviour of split-brain patients but from the cognitive and behavioural disunities that they exhibit in carefully controlled studies.'²⁷ We will introduce an alternative model against two stream model which may lead us to overcome such problem.

5.6 Bayne's Alternative model and possible problems:

We can see that Bayne, himself, provides an alternative model which he calls 'the switch model' which I think, is not enough to explain the disunity of consciousness. It can be supposed that there are two streams of *unconscious* processing from which the contents of the consciousness draw sequentially. Bayne suggests that the subject's consciousness switches

between overt and covert states. In the hidden observer prompt, (eg: hand on the shoulder) contents of the patient's experience is changed by directing one's attention to stimuli previously neglected – subject becomes aware of stimuli represented unconsciously. Spanos and Hewitt (1980) are credited for the first full representation of the switch model though the idea was first found in Freud's suggestion of 'double consciousness' where mental activity splits into two groups and the same consciousness alternately turns to either group.

Again, Behavioural disunity seen in hypnosis is best accounted for by supposing that hypnotised subjects have a single stream of consciousness that switches between two streams of processing. On ideas first forwarded by Jerre Levy²⁸ we can account for the cognitive and behavioural disunities seen in the split-brain in just the same way. Rather than assuming that the patient's two hemispheres are conscious in parallel, it should be understood that consciousness in the split-brain switches from one hemisphere to the other. Both hemispheres can process information concurrently, but takes turns to support consciousness. The switch model projects patients as though suffering from a kind of fluctuating perceptual extinction where the L(R)H is activated, stimuli in the LVF(RVF) are typically ignored in favour of stimuli in RVF(LVF). Patient might be conscious of the word 'key'(RH activity) or 'ring'(LH activity), but remains unconscious of both 'key' and 'ring' at once even when they are presented simultaneously.

The chimeric stimuli (stimuli created by conjoining two similar half-stimuli at vertical midline) experiment (Levy et al. 1972) provides crucial evidence for the switch model. A chimeric face can be constructed from the left side of one person's face and the right of another's. On some trials subjects were asked to a matching stimulus, while in other trials they were required to name the stimulus. On almost all trials subjects indicated only one match for each chimeric stimuli.

Initially Levy's group suggested that the non-responding hemisphere had a rival percept that it failed to express. Later this view was revised by Levy stating that the patient's behaviour in no way suggested a disagreement between the RH and the LH regarding each other's responses. Rather than supposing that the non-responding hemisphere has a conscious percept which it is unwilling / unable to express, it seems simpler to suppose that its percept is unconscious.

Levy's perceptual extinction experiments were followed up by giving six split-brain subjects a mixture of dot and numeral counting exercises via the usual tachistoscopic method (Teng and Sperry, 1974). Between one and five dots were presented either in the LVF or RVF, or on both visual fields simultaneously. All, save one, split-brain subjects showed massive extinction, reporting only those stimuli restricted to a single hemi-field. Gazzaniga's group also located perceptual extinction while studying the bilateral integration of tactical stimuli in split-brain patients. They noted as if a strong shift of attention to one hemisphere extinguished perceptual awareness in another.

The switch in the split-brain has certain factorials, such as the required response of the subject. Some studies note that differences between motor responses can influence the lateralisation of awareness in the split-brain. Verbal responses favoured completion of the right half of the stimulus, while manual responses favoured completion of left half of the stimulus (Levy et al 1972). Lateralisation of conscious perception could be switched merely by subjects responding with one hand rather than the other (Trevarthen). Levy and Trevarthen found that lateralisation of awareness could be switched by modulating the cognitive content of the response required by the subject. Patients asked to match chimeric stimuli based on their visual appearance favoured the LVF (implicating RH) while when asked to match stimuli based on function, favoured the RVF (implicating LH). 'The apparent distribution of

attention between the two hemispheres is not static, but may change with the nature of the task...'²⁹

In normal subjects something similar to inter-hemispheric switching was established by Milner & Dunne (1977) by using chimeric stimuli in which the vertical join was hidden by a white strip to hinder detection of the incongruity between the two sides of the stimulus. The exposure time of 100 milliseconds made it difficult for normal subjects to detect that the stimuli were chimeric. In trials where subjects were unaware of asymmetry they indicated only one face always perceived as complete. Their subjects also manifested response-dependant processing similar to Levy's experiment, with verbal responses favouring RVF stimuli and left-handed responses favouring LVF stimuli. This study provides further evidence for the switch model.

The switch model is further supported by studies of auditory processing in the split-brain. Information from each ear projects to both hemispheres, therefore commissurotomy does not lead to lateralisation of auditory information. Lateralisation can be achieved by dichotic listening paradigm, which simultaneously presents patients with competitive stimuli to each ear. Ipsilateral processing is suppressed in favour of contralateral processing with inter-hemispheric competition allowing information from a single ear to enter consciousness at a time. Milner's group found when patients were required to verbally numbers, the left hemisphere suppressed input from the ipsilateral ear in favour of the contralateral ear. Right hemisphere activation could be drawn by changing the required response of the patients. Use of the left hand appeared to have favoured RH processing, in its turn suppressing auditory information entering through the right ear.

Analysing the arguments for the limitations of the disunity models of the split-brain we can again refer to the 'key-ring' experiment. The representational and access disunity arguments assume that both hemispheres must be simultaneously conscious because stimuli

are simultaneously projected to the patient's visual hemifields and each hemisphere can respond to the stimulus in its hemifield. The hemisphere that is silent on any one trial, may be so because it is unconscious rather than being unable /unwilling to speak.

There are three lines of thought to consider how the switch model explains everyday unity in the split-brain.

It is possible that split-brain patients generally get by on a single conscious hemisphere. They are often dominated by the LH. Even when the RH does not initiate a response, the left often takes over and finishes it, sometimes being a detriment to the patients' performance.

Next, inter-hemispheric switches seem smooth and rapid, giving an impression that the patient is more conscious than reality. The ability of some patients to control both arms from each hemisphere can also mask inter-hemisphere switching. A single right-handed action might be under the control of first one hemisphere and then the other.

Finally, the lower cognitive demands of daily life allow patients to use a kind of non-focal, low-level attention that can dwell between both hemispheres. Trevarthen notices that in certain situations patients adopt a 'particular condition of mental orientation' in which awareness is bilaterally distributed. Although focal consciousness is restricted to a single hemisphere at a time, it might be possible for non-focal awareness to be distributed across the patient's two hemispheres.

Objections and replies:

Obviously, there are some objections against switch model proposed by Bayne which has been severely criticized by the opponents. The arguments offered by the opponents are as follows:

Firstly, Hilgard objects that, in some hidden observer experiments the hidden observer probe occurs after the trial's completion. The model demands the presence of a probe to be

aware of target information but only analgesia ensures that the information is only a memory of the stimulus available.

In response to this objection, following Bayne, we can mention Spanos and Hewitt's studies where they undermine Hilgard's assumption that the hidden observer experiences happen due to veridical perceptions rather than hallucinations prompted by the subject's expectations. In their cold-presser test, Spanos and Hewitt were able to modulate the levels of pain by changing the content of the hidden observer induction. Spanos and his colleagues made a further study on the hidden observer breaching hypnotic amnesia. By giving subjects a hidden observer induction suggesting that concrete words were stored in one hemisphere of the brain and abstract words in another – each with its own hidden observer – following which the subjects memorised a list containing both concrete and abstract words under an amnesia suggestion, telling them they would not recall any words on the list, it was seen that the subjects were amnesiac to items on the list. But in the cases where either of the hidden observers was contacted, subjects could recall items from the list displaying the category – specific tendency of the breaching of amnesia where, subjects recalled either abstract or concrete words from the list. Hilgard's view that the hidden observer induction itself enables subjects to access previously inaccessible experiences was overruled by Spanos' work and it was established that subjects given a hidden observer induction felt similar level of pain as hypnotised control subjects, thereby dismissing Hilgard's objection to the switch model.

Secondly, Hilgard's states that at least one hidden observer subject will produce *covert* and *overt* reports *simultaneously*.

To reply such objection, following Bayne, we also say that it is not clear how the switch model accounts the findings of simultaneous reports. Though Spanos and Hewitt in their specified simultaneity measures of the hidden observer, have operationalized it to within

500 milliseconds, long enough for the subject's attention and their stream of consciousness to switch from one processing to another.

Thirdly, Hilgard objects that the reports of hypnotic subjects' occasional intrusion of the stimulus into consciousness are not given when the covert experience is accounted for.

In response to this objection following Bayne, we can say that this objection undermines the resources of the switch model. Previously suppressed stimulus might intrude the subject's consciousness either spontaneously or other through a hidden observer probe and the phenomenology of these two intrusions differ. When the attention is drawn spontaneously to the stimulus, subject will describe the stimulus as intruding into consciousness, while at the time when the attention will be drawn to the stimulus by a hidden observer probe, the subject will describe it as accessing experiences of a 'hidden part' of him. Those administering hidden observer induction may not endorse diminutive ideas of the hidden observer though their practice suggests otherwise when they tell their subjects that they are now talking to 'the part of the subject', in contrast to 'the hidden part of you.'

Fourthly, There is some evidence which suggests that split-brain patients have independent attentional span. It was found that the two hemispheres could carry out visual discrimination tasks independently and in parallel, indicating a degree of attention division in the split-brain ³⁰Some amount of hemispheric independence in visual attention within the split-brain was supported by some other studies also.

In response to this objection, it is said that these findings are decried by other studies indicating that attention remains phenomenally unified in the split-brain. In an experiment requiring split-brain patients to either synchronise their two indexes or to alternate them rapidly, Kreuter et al (1972) concluded that a maximum effort by one hemisphere withdraws capacity from the other – because the absence of the corpus callosum is fulfilled by a “capacity distributing system” located in the brain stem. In tasks requiring subjects to match

the presented stimulus to a template and another involving lexical memory it was found that cognitive load in one hemisphere interfered with performance in the other hemisphere.

Semantic priming studies also suggest attentional integration in the split-brain. A study discovered normal levels of negative priming in the split-brain: LVF items inhibited responses to categorically related items in RVF (Lambert 1993). Lambert concluded that there is a single system of selective attention in the split-brain involving sub-cortical connections. In fact, rather than undermining the claim that consciousness remains unified in the split-brain the work on attention may actually provide some support on the view.

Fifthly, The switch model is considered anatomically implausible because the main band of fibres connecting the two hemispheres has been severed between the two cortical regions making it impossible for consciousness to move between the two.

To reply such objection, it is said that in some attentional systems remain unified in the split-brain and these render possible the 'shuttling' of consciousness between the two hemispheres. Secondly, there is independent evidence of unified consciousness in the absence of corpus callosum as seen in acallosals. They show few of the signs of behavioural disunity that characterise the split-brain syndrome. The relationship between mechanisms underlying wakefulness and those underlying consciousness remains uncertain, but it is possible that the sub-cortical systems implicated in modulating wakefulness and arousal play an important role in maintaining coherent relations between the hemispheres.

Sixthly, Some question the switch model's ability to account for bilateral integration in the split-brain. We should note that evidence for conscious bilateral integration is uncertain.

In response to this objection, it is possible that behaviour appearing to involve inter-hemispheric integration might be produced by a single hemisphere exerting control over same organs of both sides (eg; right and left hands).

Supposing split-brain patients have experiences straddling both hemispheres, it would not be at odds with the switch model. It is possible that although consciousness can straddle the two hemispheres in different places at different times, it cannot fragment in the way demanded by partial unity. To evaluate this proposal we need to know more about whether patients can simultaneously be conscious of tactile stimulation in both hands. We might need to reject full-unity version of switch model in favour of partial unity, but it is too early for that.

Seventhly, The switch model forwards that the contents of consciousness are sequentially informed by processing in each hemisphere. Patients should report to sudden changes in the contents of their consciousness, they cannot be apparently unaware of alteration between rival precepts if they are subject to inter-hemispheric rivalry.

We think that this form is the most challenging objection to the switch model. But there is extensive representational overlap between hemispheres. There will be occasions in which the contents of the patient's experience will undergo radical changes as consciousness switches between hemispheres. It is not uncommon for patients to be unaware of these changes to the contents of their consciousness. In order to be aware of inter-hemispheric switches in consciousness the patient must simultaneously activate both hemispheres – which are ruled out by the switch model.

Eighthly, Some consider the split-brain patient to have two streams of consciousness which are sequentially active rather than a single stream of consciousness whose contents are drawn from each hemisphere in succession. They question the switching of consciousness in the split-brain between the two streams of cognitive activity and aim to state that the split-brain has two streams of consciousness that operate sequentially.

In response to this objection, we can say that in phenomenological terms, the stream of consciousness can utilise both one-stream and two-streams versions of the switch model,

reducing the question to whether inter-hemispheric switching interrupts the continuity of consciousness. If there is no breach in the continuity of consciousness in the split-brain, then a single stream of consciousness is indicated. We do not know if inter-hemispheric switching brings about a gap in experience. Such gaps are not reported, but then, if there were such gaps they would go unreported.

The single-stream model holds that consciousness in the split-brain has a singular (sub-cortical) ground, whereas the two-streams model suggests that the LH and RH have independent mechanisms of consciousness which have no common substrate of consciousness in the split-brain. Evidence clearly favours the one-stream model. There is only one substrate of consciousness in the split-brain and it is grounded in the undivided sub-cortical network. RH and LH activation in the split-brain generates conscious content only because it is suitably incorporated into that system.

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