

**Article**

## **Events to Dualism**

Frank De Silva\*

### **Abstract**

Perception is a continuous experience that exists at every instant, across a set of simultaneous events in the brain. Special relativity physics states that there can be nothing physical, that connect simultaneous events. As such, perception cannot be physical but non-physical or dualistic. This argument is analysed further, and a new concept called Concept A is introduced. With the aid of Concept A, free will is explained.

**Keywords:** Continuous experience, special relativity, event, dualism, concept, free will.



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### **Events to Dualism**

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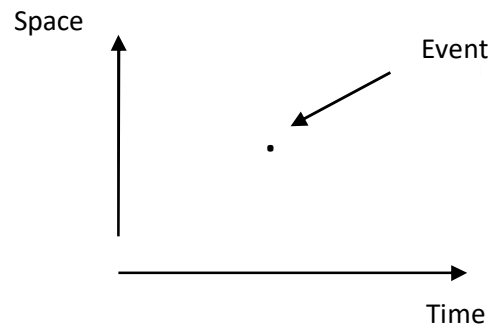


## **1. Event**

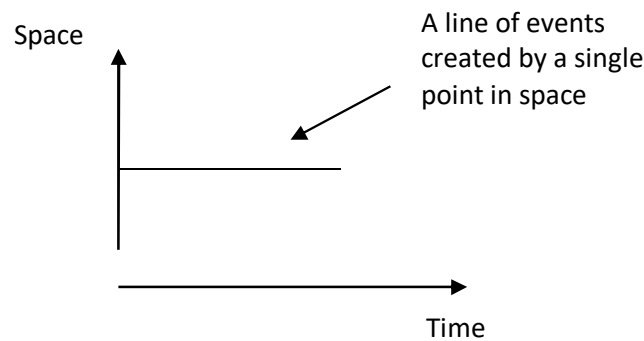
The definition of an event from physics is a point in space-time. If we were to consider one dimension of space and one dimension of time, then an event will be a single point as shown in Fig 1. A given point in space, will correspond to a series of points or a line when taken over a period of time as shown in Fig 2. Thus in a given coordinate system an event will be defined completely by its coordinates  $(x, y, z, t)$  where  $x, y, z$  are the coordinates in space and  $t$  corresponds to the instant of time.

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**Fig 1.** Event



**Fig 2.** A single point in space over time will create a line of events

### 1.1 Passage of time

Time passes from one instant to the next. This allows for a well-defined **past, current and future instant of time.**

### 1.2 Perception

Consider the experience of watching an apple. If we close our eyes the apple cannot be perceived. From this observation we can conclude that the light from the apple stimulates the eyes which in turn stimulate the brain, which results in an apple appearing in the mind. From this experience we get the following axioms.

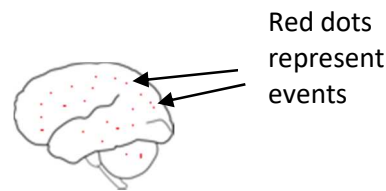
**Axiom A:** Stimulating events in the eyes give rise to perception located within the brain at the current instant.

**Axiom B:** Perception consists of two components:

- a. The observed or the object of perception (U), that is the apple.
- b. The perceiver (I) or the thing looking at the apple.

### 1.3 Events of perception

Consider the distribution of events in the brain pertaining to perception. U, the apple or the first component at any given instant will correspond to a set of simultaneous events in the brain as given in Fig 3.



**Fig 3.** Simultaneous events of perception at the current instant

I, the second component by the act of perception will connect this set of simultaneous brain events.

## 2. Special Relativity Physics and Simultaneous Events

Special Relativity groups all events into two distinct groups:

- a. Time-like separated events
- b. Space-like separated events.

### 2.1 Time-like separated events

These are events that are separated in space and time such that there is sufficient time for a beam of light from one event to have reached the second event.

### 2.2 Space-like separated events

These are events that are separated in space and time such that light from any one event can never reach any of the other events. Thus, simultaneous events are space-like separated. That is, even two events occurring 0.0001 mm from each other in the same instant will be space-like separated.

### 3. Pivotal Argument

P1: Thus, the events of U at a given instant is space-like separated.

P2: Perception connects these events.

P3: Special relativity states that nothing physical (material) can connect space-like separated events.

**C1:** Therefore, perception as it connects space-like separated events of U, cannot be physical. That is, it is non-physical or dualistic.

The above conclusion can be false if one of the premises is false. P3 is accepted physics and as such will be taken as true without argument (Einstein, 2015). In the case of P1 and P2, it can be false if at any given instant U is not a set of events but instead is a single event or perception is not a singular process but a set of parallel processors somehow appearing to be one etc. Any such view is to deny the truth of the axioms, that is, the perception of the whole apple from instant to instant is not true. In this paper, we will take the axioms to be true and events to be distributed as stipulated by the axioms. Thus, taking the conclusion C1 as true, we will proceed to analyse where it may lead us.

### 4. Hearing

Consider a note of music. A musical note is undefined in an instant of time. It exists over a period of time. Sound in general exists across time and not in an instant. From this observation we get the following axiom.

#### **Axiom C**

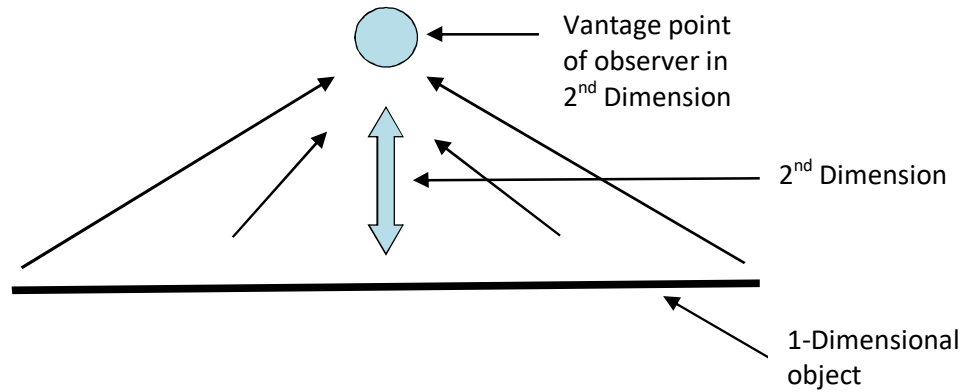
Hearing consist of two components.

- a. Sound a set of events distributed across time (U).
- b. The hearer or the thing hearing the sound (I).

**C2.** From axiom B and C we can conclude that U is 4-Dimensional set of events that is perceived and heard (by I).

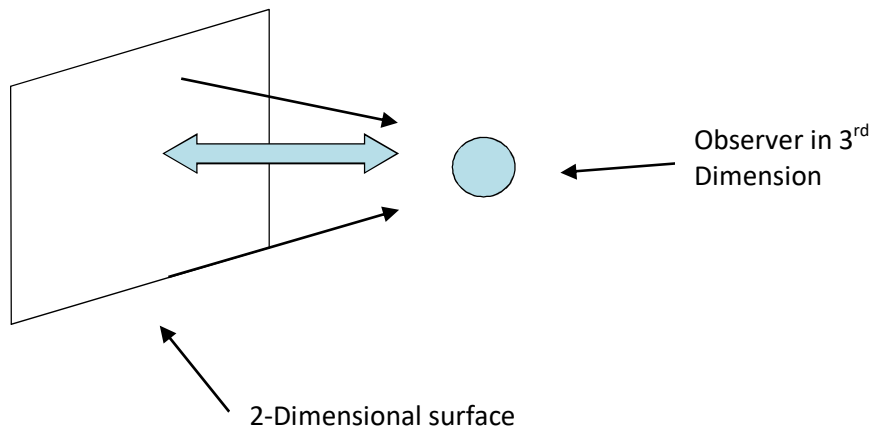
## 5. The Geometrical Vantage Point of I

- a. In order to observe a 1-Dimensional object fully, you need to be in a 2<sup>nd</sup> Dimension (see Fig 4).



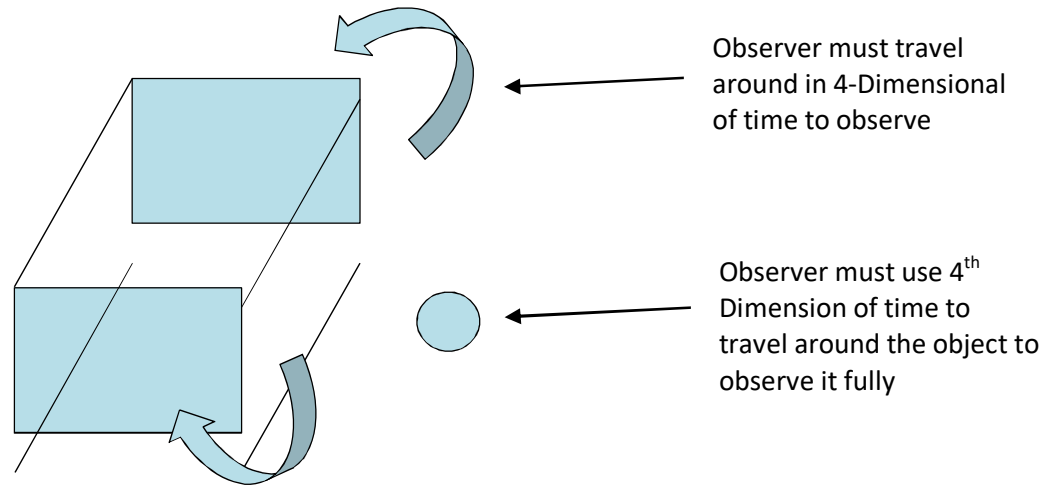
**Fig 4.** 1-Dimensional object vantage point located in 2<sup>nd</sup> Dimension

- b. In order to observe a 2-Dimensional object, you need to be in a 3<sup>rd</sup> Dimension (see Fig 5).



**Fig 5.** 2-Dimensional object vantage point located in 3<sup>rd</sup> Dimension

- c. In order to observe a 3-Dimensional object, you need to have access to the 4<sup>th</sup> Dimension of time to travel around it and observe (see Fig 6).



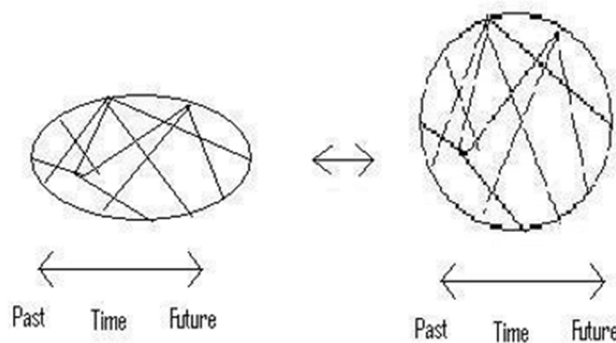
**Fig 6.** 3-Dimensional object vantage point located in 4<sup>th</sup> Dimension

**C3:** In C2 above we concluded that the events of U are 4-Dimensionally distributed. Thus, the **geometric vantage points for I would be in the 5<sup>th</sup> Dimension.**

C3 further straightens C1 where we noted perception is non-physical.

## 6. Introducing Concept A

Consider changing the shape of a 4-Dimensional object as show in the Fig 7 below.

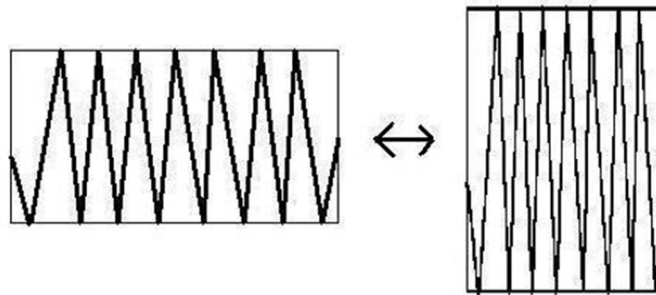


**Fig 7.** Concept A – A change in shape

As the change is across time and space, from within the 4-Dimensional object such changes will not be observed. Further such changes as they act across space–time, will not violate conservation of energy as it changes not just the present and future but also the past. This type of change will be called Concept A.

### 6.1 Changing frequency of oscillations via Concept A

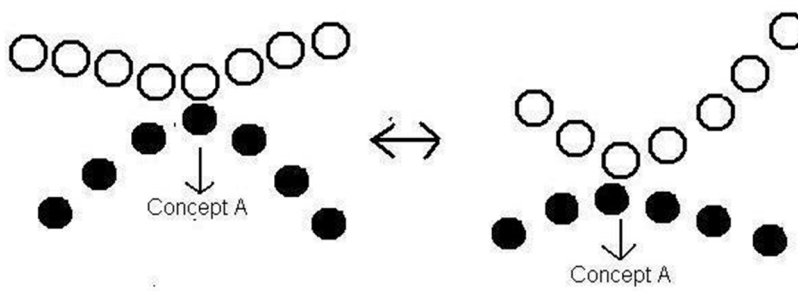
Fig 8 below shows a particle oscillating over time. Concept A can contract time leading to an increase in the frequency of the oscillations.



**Fig 8.** Concept A changes the frequency and amplitude of an oscillating particle

### 6.2 Concept A acting on interacting particles

Consider a particle over time. It would be a 4-Dimensional string. Now consider the action of Concept A at a point of interaction between two such strings as shown in Fig 9. It can be seen as pulling on one string leading to changes in the path of both strings across past, present and future.



**Fig 9.** Two particles over time will be like two strings entangled with each other. Concept A acting at a given point will change the future but also the past

## 7. Hypotheses A: the Mind-body Interaction and Concept A

Consider moving one's finger or hand. This ability to move does not feel to be constrained in any deterministic way by prior states of the mind. From this observation we get the following axiom.

### Axiom D

Free will gives rise to movement and consist of two components:

- a. The part of the body that is moved (U), e.g. Finger, Hand etc.
- b. The thing (I) that initiates and controls movement.

It is hypothesised that free will comes about by I acting on the events of U (located in the brain), via Concept A. Thus, acts of free will result in change not just in the present and future but also in the past. This hypothesis is in agreement with C3 that the vantage point of I is in the 5<sup>th</sup> Dimension, as such, it can change the observed 4 Dimensions of U. This interaction is as shown in Fig 10.

### The Dualistic Mind Body Model

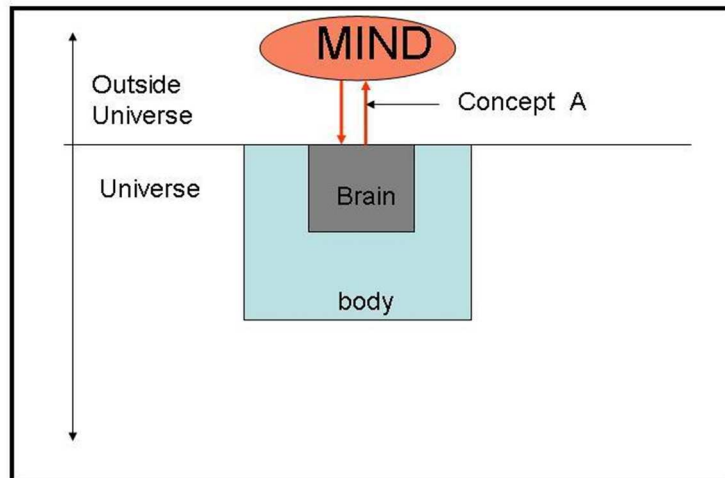
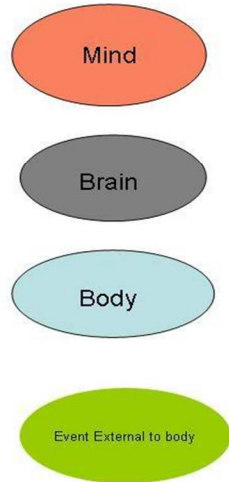


Fig 10. The interaction between Mind and Brain via Concept A

The interaction can be shown via the following four states as given in Fig 11.

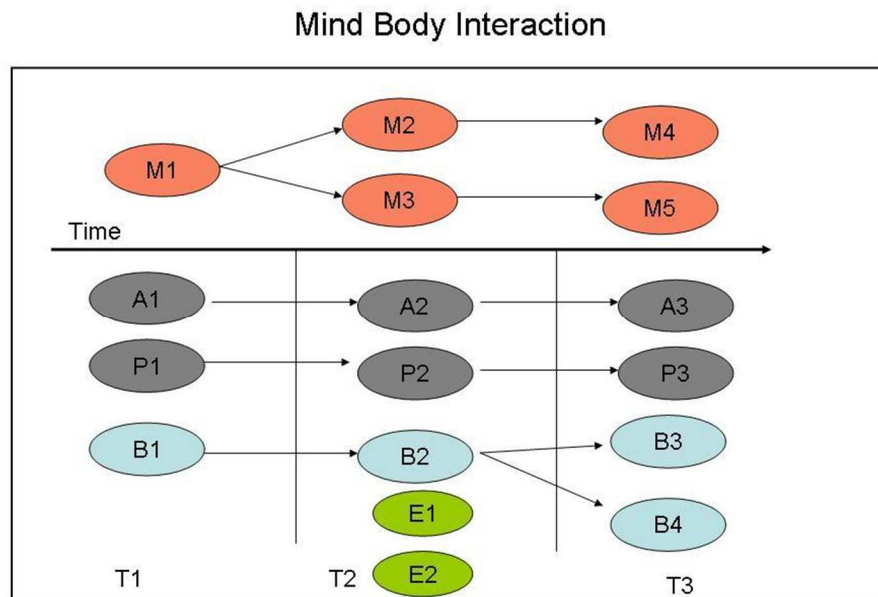


## 4 states Types



**Fig 11.** Four states in the mind-brain-body-world interaction

Consider the events associated with asking a person to make a choice of clicking a button on the occurrence of an external event such as a light flashing or not flashing. This is shown in Fig 12.



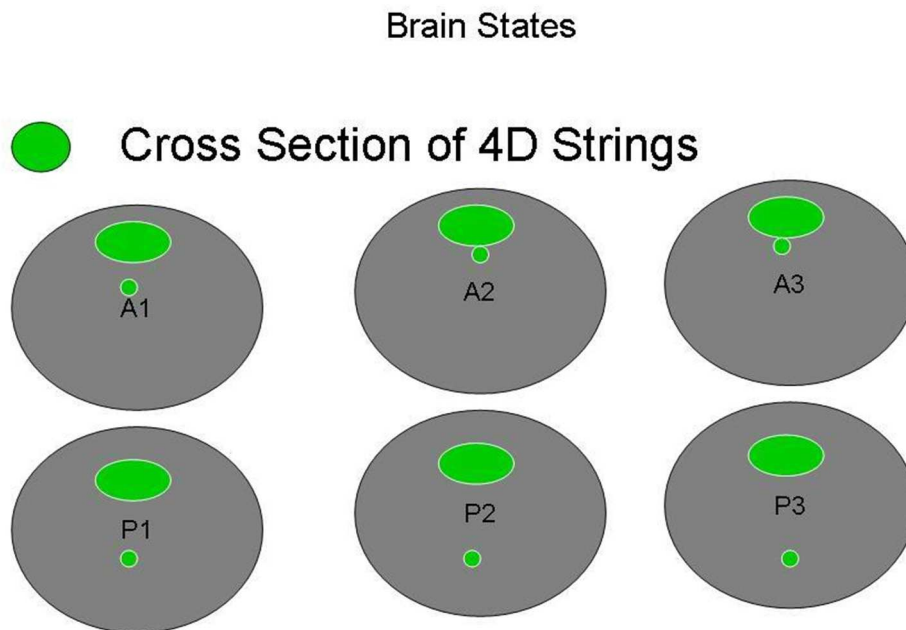
**Fig 12.** The corresponding change of states in the mind-brain-body-world interaction over three instants of time

The mind makes a choice at time T2 on observing events E1 or E2 (Flash of light or No flash of light). The choice the mind makes at time T2 will be either M2 or M3. This will lead to the mind going to state M4 or M5 respectively. In regards to the state of the mind prior to T2, that is at T1, it is M1, nothing has changed.

The body has state B1 at T1 and at T2 the state B2. However, at T3 the body will have either state B3 or B4 depending on the choice made by the mind. That is B3 might be the state in which a button was pressed and B4 the button was not pressed.

Now the interesting aspect of the hypothesised interaction can be seen in the brain states. The choice of the mind at T2 will not only alter the brain state to be A2 or P2 at T2 corresponding to M3 and M2 respectively, but also change the past brain state to be A1 or P1. The brain state A1 and P1 are both compatible with the single mind state M1. The future brain state will change to A3 or P3. It is this changes to the past that would be the hallmark of Concept A type changes.

The physical changes in the brain states is shown in Fig 13:



**Fig 13.** The brain state changes via Concept A as seen acting on two particles

## 8. Hypotheses A to Theory A

We shall now explore potential evidence for Concept A to be the vehicle of interaction between mind and brain. At the onset it must be noted that C1, that is the observation that simultaneous events are connected by perception, by itself stands as strong evidence for I to be outside the 4 Dimensions U of space-time events. We shall explore two other sources of evidence.

- a. Circumstantial evidence provided by Electrical Potential studies of the brain
- b. The expanding universe or the Big Bang theory.

### 8.1 Libet's experiment on free will

In the famous experiment carried out by Benjamin Libet (Libet et al., 1983), a person makes a choice to press a button or not to do so at a given time, that the person notes down. It was noted in this experiment that when a choice is made at say T2 as stated by the person, nevertheless prior to this time, proceeding by about 300ms, there can be detected an increase electrical potential in the brain. It was interpreted at the time as showing that free will choices are not free as prior to the person making the choice subconscious processes were already in operation, as seen by the increased electrical potential 300ms before the time of making the choice. However, this is exactly what would be expected if free will was brought about by Concept A type changes. Brain states at T1 prior to the time of making the choice at T2 will change as a result of the mind making a choice at T2 (see Fig 12).

### 8.2 Variation to Libet experiments

Now if the observation from Libet experiments is due to Concept A, a further confirmation can be made by the following scenario. In Libet experiments the subject made a choice at a time of their choosing if to press the button or not to press.

Consider the following variation. Suppose you tell a subject to decide to press or not press a button when they see a red-light flash. The light is flashed randomly at a time unknown to the subject. Now if the result shows that there is a change in electrical potential in the brain prior to every time they choose to press the button, this will be circumstantial evidence for Concept A. As the subject or the subjects brain could never have known when the light was going to flash. Such an experiment has been carried out by Jo, Hinterberger, Wittmann, Borghardt and Schmidt (2013). The results are as expected (Jo, Hinterberger, Wittmann, Borghardt, & Schmidt, 2013).

### **8.3 Evidence from the Big Bang**

The Big Bang theory says that all of space-time started as a single event or point. That is the whole universe was the size of a single event and it is expanding. Thus, both space and time is created in this expansion. As such this would mean there is a continues change in shape of the universe. Expanding 4 Dimensionally means changing shape 4 Dimensionally. Thus, the universe does allow for 4-Dimensional shape changes. This is what is needed for Concept A to be possible ("Big Bang,").

## **9. Concluding Argument: Minds and Events**

Following Rene Descartes meditation (Descartes, Tweyman, Haldane, & Ross, 1993), we shall now summarise the above findings:

### **Category 1: Minds**

I exist, and I am a mind. Therefore, Minds exist.

### **Category 2: Matter**

I have feelings. These feelings originate from sensors in what I call my body. The sensors are receptive to stimulation from events created from within my body and from events created from outside my body. The stuff that bring about these events I shall categorise as matter. Thus, my body is also made of matter. Therefore, Matter exists.

### **Category 3: Space**

My body needs Space and Matter in general needs Space. Matter can exist only in Space. Therefore, Space must exist.

### **Category 4: Time**

My body needs Time to change and Matter in general needs Time for change. Matter can change only in Time. Therefore, Time must exist.

From the above observation I conclude that these four categories permeate each other and exist equally with none more abstract or less abstract than another.

### **Now to the question of the origin of these categories**

Could it be that any one or more of these categories can be made from any one or more of the remaining categories? Could these categories transform from one to another?

Matter needs Space and Time for its existence, therefore without Space and Time, Matter will not exist, as such Matter could not have been the origin of Space and Time.

From physics it has been observed that Space and Time can give rise to Matter spontaneously. As such Matter maybe a result of a localized change to Space and Time.

So then, could Space and Time be the origin of everything else?

Again, from the theory of the Big Bang all Space, Time and Matter originated from this singular event. Therefore, Space and Time could not alone have brought about the other categories.

Since the Big Bang was an event, could it be that all things are made from events?

Where there is Space, Time and Matter there is always an event.

There can be no Space, Time or Matter without events.

In an instant all of Space and the Matter is nothing more or nothing less than a set of events. So then Space, Time and Matter is one and the same as a set of simultaneous events from one instant to the next.

From this observation the four categories can be reduced to two categories

#### **Category 1: Minds**

#### **Category 2: Events**

Now then, can Minds exist without events? We know that simultaneous events give rise to feelings in Minds. We know from special relativity simultaneous events cannot give rise to anything physical or material. Therefore, feelings cannot be physical or material. Now as feelings are a part of Minds, we must conclude Minds are not physical.

Now can the Mind exist without feelings OR does feelings create the Mind, that is one and the same as the Mind?

If feeling create the Mind then as feelings are created by events then Space, Time and

Matter which we have concluded is the same as events, must also have feeling and thus be one and the same as a Mind.

Thus, we would need to conclude a rock has a Mind or is part of a Mind to the same extent that my brain is a Mind or is part of a Mind.

This conclusion is not palatable as such let's consider the OTHER alternative.

Now if a Mind can exist without feeling then we also know that the Mind can create events (e.g. throw a rock, move a finger).

So then given that the mind can create events then the Big Bang (The Event) could have originated from The Mind in order to evoke feelings in other minds.

These other minds may have also been created by The Mind.

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## Appendix A

### The object of study in consciousness

Acquisition of knowledge by humanity is dependent on the consciousness of the individual. When a person makes an observation, and comes to an understanding, this understanding is this person's subjective knowledge.

If another person, on making a similar observation, arrives at a similar subjective understanding, this knowledge they share can be taken to be part of humanity's objective knowledge.

Thus, all of humanity's objective knowledge is a subset of all of humanity's subjective knowledge; that is, there can be no objective knowledge that has not been some person's (dead or alive) subjective knowledge.

Thus, an intrinsic assumption behind all of humanity's objective knowledge is the similarity of the axioms of consciousness of the individuals.

With regard to the study of consciousness, the object of study must be once own consciousness. In the study of consciousness, if a person gives a description of consciousness that does not correspond to his/her subjective axioms of consciousness, then with it must also be given the transformation that reconstructs these axioms. If not, this description is but only a fairy tale.

Seen in this light behaviourism is a mistake as it attempts to study consciousness via the behaviour of another person. This is like hoping to study mathematics by getting somebody else to study it.

## **Appendix B**

### **Pinocchio Syndrome, the Turing Test and the Axioms of Consciousness**

From the very inception of one's own consciousness, a human knows most perfectly well one's own consciousness and its associated experiences.

All its (humans) interactions with the universe is via its consciousness.

Now consider a child, it will initially think everything is conscious like itself. A baby will smile at a toy. So the toy starts of having passed the Turing test.

With more learning the child will start to pass and fail different objects as to if they are conscious or not.

Thus, each person runs a Turing test on objects encountered all their life all the time.

Now in the past people ran Turing test on the sun, stars, the weather, volcanoes and most of the time these things passed their Turing test. As such they were worshiped as gods.

#### **So, the definition of the Pinocchio syndrome is this:**

From childhood we have a tendency to assign consciousness to everything. Then we run a Turing test to assert if its correct or not.

All of us suffer from this syndrome and we need to keep this syndrome in mind when it comes to Strong AI. If the Turing test is weak then Strong AI would be a worship of gods.

Now, a better approach to this question would be:

- a. Each human knows very well what it is to be conscious. What constitutes a conscious experience. As such it would be possible to define a set of Axioms, the Axioms of consciousness.
- b. In regards to computers again, a computer is not a black box. Humans know exactly how they work. As such it would be possible to decide if the working of the computer can bring about the Axioms of consciousness.

## **Foundation of all Axioms the Axioms of Consciousness**

Consider the experience of watching a live performance of music and dancing to the music. This experience has the following axioms

### **Axiom 1**

Consciousness consists of two components:

- a. The Observed (U)
- b. The Observer (I)

### **Axiom of U**

- a. The observed (U) is a 4-Dimensional (4D) object. (This is the totality of all sensations and actions. Consider music, it must span time as such the whole experience is 4D.)
- b. The 4D object observed has finite boundaries in Space and Time.
- c. U being a 4D object can be broken down into component 4D objects.

### **Axioms of I**

- a. Ability to observe U
- b. Feelings
- c. Free will
- d. Curiosity and playful behaviour

### **Axioms resulting from the interaction between U and I**

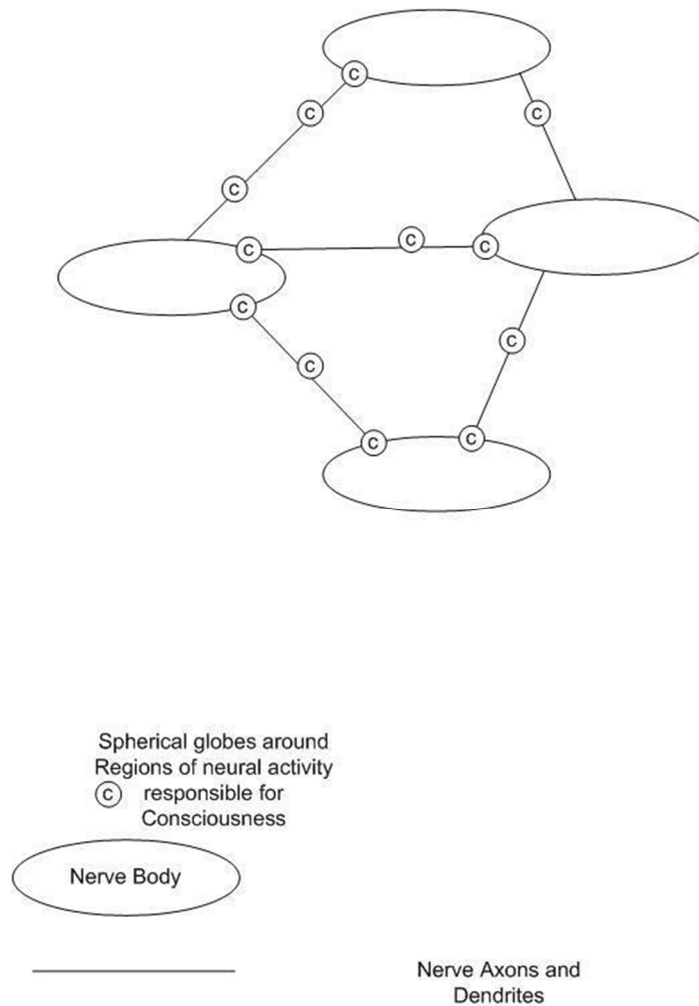
Based on the type of interaction with I, U can be broken down into the following three components.

- a. Those which can evoke feelings in I (e.g. vision) referred to as Sensory objects.
- b. Those whose motion can be controlled by the free will of I (e.g. hand) referred to as Motor objects.
- c. Those which are model of past Sensory objects and Motor objects (e.g. Memory) referred to as Memory objects.



## Appendix C

### Distribution of brain activity and perception



**Fig 14.** Distribution of brain activity and perception

It is commonly held belief that nerve impulses and activity at nerve synapses alone can explain consciousness. However, it will now be demonstrated that the need for a connection between simultaneous become even more evident when the actual distribution of these events (nerve impulses and activity at nerve synapses) over space and time is considered. From a physics point of view a nerve impulse or the activity at nerve synapses is more than a single event. However, for this analysis a nerve impulse as well as a synaptic vesicle will be considered as single object (Objects of perception) that create a single event by its location in space and time. One of the fundamental properties of nerve impulses is that it must end before it can cause the next event. That is a nerve impulse dies by discharging at a synaptic cleft, which will then release a synaptic vesicle. Essentially, these objects are transient with a limited lifespan and distinct space between the object. Thus, if you were to consider all the nerve impulses and activity at synapses at an instant in time. The following would always be true:

1. These objects are physically separate from each other; and
2. None of the objects that are present at an instant in time have been caused by any of the other objects that are present at that same instant. If you were to consider a set of balls on a pool table, when one ball hits another after this event of hitting, both balls remain on the table, this contrasts with what takes place in the brain as a nerve impulse must essentially end its life before its subsequent cause will arise by way of a synaptic vesicles. Thus, at any given instant all the objects present do not also contain the causative objects. All the causative objects must have essentially come to an end.

Given observation 1 and 2 let the objects of perception at any given time be enclosed in the smallest possible virtual spherical globes. Then over any length of time these globes will never intersect. Thus, they are separate in space and time. These globes will form an ever-changing pattern. With none of the globes having been created by any of the other globes at any given instant (Fig 14). We know that the activity within these globes together gives rise to a single phenomenon such as perception. However, we know that distinct space and time cannot have any form of connections (special relativity). Yet phenomenon such as perception makes exactly such a connection as it is a singular result of all these transient objects.