

Intelligence and Consciousness: Exploring new frontiers

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My grandfather did not study beyond primary school. Nevertheless he was consulted by the local magistrate of the government in the resolution of conflicts and complaints in the village. I remember asking my father why his father was respected. The answer was that he had an uncommon ability to plan, to make decisions. Was he intelligent?

If intelligence is a cultural universal, it must be the ability to plan and structure our behaviour with an end in view. The end is to achieve common good. Here I am thinking of Gandhi, and coincidentally on his birthday, October 2; he was born 150 years ago!

I grew up at a special time in India, the era of Gandhi and our struggle for independence. Gandhian ideas had flooded the minds of the young and the old. My father too was a follower of Gandhi. What stayed with me was Gandhi's simple phrase: plain living, high thinking! In other words, there is no need to flaunt your wealth. There is, however, a need to have high thoughts that rise above petty things in life.

In addition, I was deeply influenced by Gandhi's practice of love and non-violence. If there is only one good thing you can do, practice non-violence. It covers all essential virtues, much as the footprints of an elephant cover those of all other animals in a forest. Some of you here are teachers. When you practice non-violence, one example would be your being non-offensive to students when you give them corrective feedback.

My father told us, "You are 6 siblings. Each one of you is intelligent, I know, you do well in school. But be a 'good' person when you grow up! Live simply, let your thoughts soar high, and be non-offensive! Never be aggressive."

How does it connect to becoming intelligent? When I think back, not everyone is very intelligent – indeed, that would be impossible! If you train me for 100 years to be Bertrand Russell, I cannot turn into Russell. But I can try to be as good as him, even better! All of us can try to be good regardless of what our intelligence may be.

But now getting back to intelligence, and to planning our actions for common good, as my grandfather did. Let me ask: what is intelligence all about? Does it have anything to do with the brain? Yes, of course! Different parts of the brain have different functions although they all work together. In fact, in knowing, feeling, and doing something, our whole body is actively involved; that includes the brain.

How does the brain work? As different parts of the machine have different functions, so also does our brain. A.R. Luria, often regarded as the father of neuropsychology, showed that the brain's work is organized in three major blocks. The front part of the brain, the frontal lobe, is active when we plan and execute what we have planned, when we make decisions, and evaluate them, and when we can reflect on what we are doing.



Does intelligence have anything to do with the brain?

Intelligence and —PASS theory

Like a machine, different parts of the
brain have different functions.
They are separate but dependent. . .

Damage to the frontal lobe reduces our ability to perform these activities. And depending on which part of the frontal lobe is impaired, we may not be able to keep our emotions from interfering with our decisions. As we age, we may lose the ability to judge our decisions, and to judge how our actions may affect others.

The back of the brain is generally active in processing information in two ways—simultaneously, or in sequence. Examples of ‘simultaneous’ processing include processing visual and spatial information (drawing a circle within a triangle as different from a triangle within a circle), putting words and sentences together to see a pattern and a theme running through a narrative or argument.

Another part of the back of the brain is activated when we try to repeat a sequence. For example, we may try to say six words that we have just heard (*cat, boy, wall, shoe, key, tree*), or we may repeat a sentence without much meaning (*The brown purpled the red yellow that pinked the white*), or we may copy a series of dance steps.

Paying Attention? Why, that means we are alert. We are alive. All living creatures pay attention. For example, the earthworm responds to salt water, the frog attends to an insect on a leaf – sorry, the insect doesn’t or cannot pay attention to the frog at that moment. A newborn infant attends to a great variety of things— for example, she looks for its mother’s nipple and sucks. While the infant also sucks at an artificial nipple that produces no milk, the pattern of sucking is distinctly different. In English, we call that device a ‘pacifier’ because it calms the infant. But the clever little infant can tell the difference between the object that gives milk and that which does not. The infant knows the difference between ‘nutritive sucking’ and ‘non-nutritive sucking.’ We adult observers can discern the difference from the varying patterns of the infant’s sucking.

The importance of a base for knowledge

Let us remember that the four mental functions ‘float’ like boats on a sea of knowledge. I cannot plan and make decisions without adequate knowledge-base. Nor can I attend to or process information that comes either through my senses or from inside me as thoughts and images.

What is the source of my knowledge? There are two kinds of knowledge. We gather knowledge that is stored in our long-term memory. But is our long-term memory the only source? No! Knowledge is also stored in books and documents of various kinds, and of course in the computer.

“The brain consists of a great many modules that process information more or less independently of each other. It seems likely that it will be easier to discover how one of those modules works than to explain the functioning of the brain as a whole.”

Chris Frith

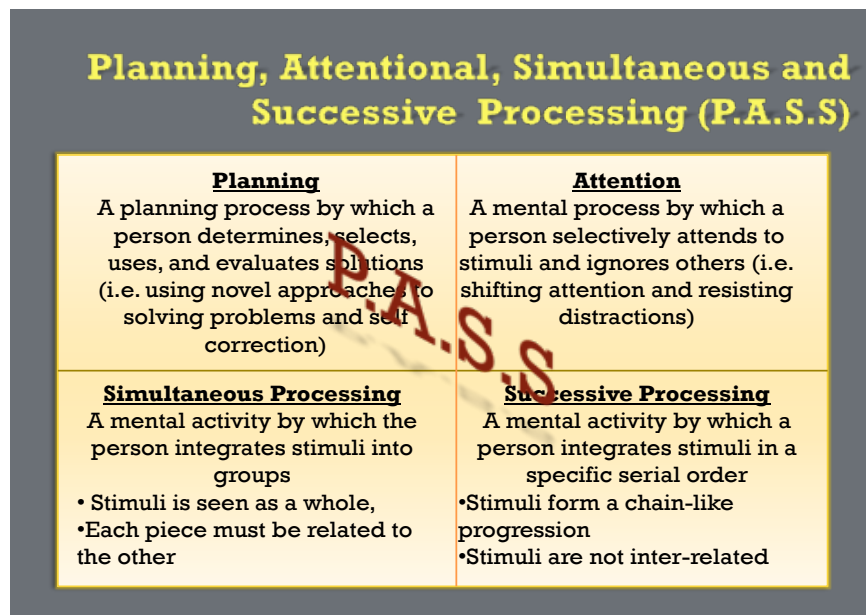
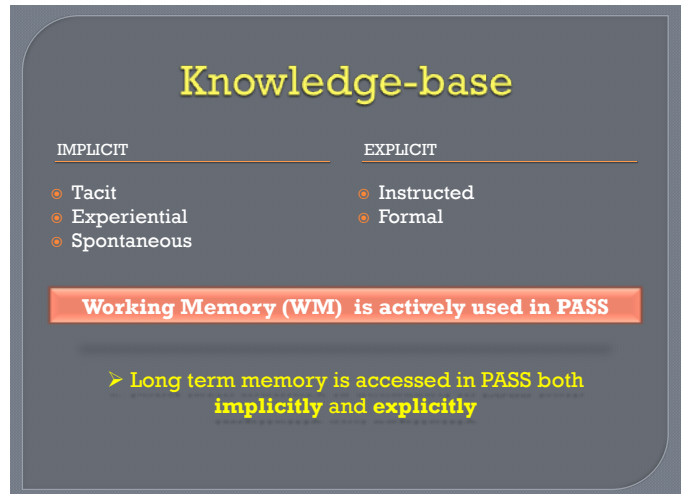
But then you may ask: *Who knows?* Is there a little person in your head, a person the size of a little finger or thumb? A homunculus as it is named? But before we leave this page to answer this question that leads us to explore consciousness, let us talk about kinds of knowledge. There are two kinds that make up our knowledge base, simply speaking.

Implicit knowledge that we gather through observation and experience, often without being aware of when we and how we are gathering it, that is, spontaneously. How does a woman feel when she is weeping? Picasso has a painting of a weeping woman. How do you feel and think when you look at the painting in a museum?

We also come to know about feelings and emotions by reading books on Psychology, or about mathematics in school. This is simply Instructed knowledge, often obtained through formal learning. It is gathered explicitly.

While we are in the process of gathering knowledge, we remember it for a little while, then it is retained for long-term storage. As we need the knowledge, it comes to life arising from the long-term memory. Let's try a line from a poem: Our sweetest songs are those that tell of saddest thoughts! How do we understand it—how your feelings are aroused? Do tears sometimes well up in your eyes when you recollect the emotions in tranquility?

Processing information is then what we do when we know. Essentially, the four major processes of PASS define intelligence; but it is not the only correct view of intelligence.



A Model for Intelligence.
Adapted from
J. P. Das & S. Misra:
Cognitive Planning and
Executive Functions.
SAGE Publications, 2015

Is speed a sign of intelligence?

However we may define intelligence, many people think that intelligence is essentially how quickly a person can do something. That is, speed is a measure of intelligence. Isn't that so? Speed is then a universal measure, a sort of biological scale that cuts across cultures and countries. And it can be easily observed or measured by simple devices as some psychologists have demonstrated for Reaction Time.

But let's think about speed of response. Sometimes thinking slow is required. For example, a girl in romantic distress approaches me, an older psychologist, for advice about whether to continue her current relationship or break it up. She narrates her story and asks "what should I do?"

I say to her; "Give me some time, then I will tell you."

On the other hand, suppose there is a fire in the famous museum in Paris where they display the 'Mona Lisa'. Fire is spreading fast, and you are very close to the nearest exit. Which painting would you save? You have no time to think. Just grab the ones that are closest to the exit and run!

Speed by itself cannot always be a measure of intelligence—Speed depends on what type of cognitive processing is required, and what the situation demands.

Exploring Consciousness

A robot can be much speedier than a human being, even speedier than the scientist who designed it. Is the robot more intelligent than humans? Well, then how are we different from robots? Is the robot conscious?

Let us agree that there are three states of consciousness we all have experienced: Awake, Dream, and deep sleep.

People in coma are not fully conscious; neither are you as you lie on an operating table under total anaesthesia.

Once we are awake, are we conscious of everything that we see, hear, touch, taste and smell?

Let us have an example.. Suppose you look momentarily at a picture of a man walking his dog. The picture is then taken away. What did you really see? Your eyes look at the entire picture, but your brain sees only the dog, especially if it was a rather large dog. You realize now why eye-witness evidence can be unreliable!

Dreams are a stage of consciousness. Sometimes they can be triggered by a bee buzzing around a pomegranate lying beside the dreamer just before waking up.

Salvador Dali indeed painted that dream!

Then there is deep sleep. How conscious is the sleeper? Perhaps at the lowest state. Veteran meditators can enter into a deep state of sleep-like consciousness wherein they are unaware of anything around them or within them like thoughts and feelings. Sometimes they are unaware that they have no awareness! That's what they report!

Obviously, robots that dream or meditate may never be built. But even if we can make 'intelligent' robots, would they have access to consciousness? That is, would they be able to reflect, have knowledge of their own existence?

Do robots bother with the hard problems of consciousness, such as:

1. Is there a self?
2. Does consciousness exist outside the body?
3. Do we have free-will?
4. Can we separate emotion from reasoning?

I have discussed these questions in the final chapter of my book *Consciousness Quest: Where the East meets West* (SAGE publications, 2014).

I do not think that robots have a self-conscious mind. They are not moved by listening to Joan Baez when she sings:

“Be not too hard,
For life is short
And nothing is given to man
...Be not too hard when he
Blindly dies
Fighting for things he does not own “

Thank you!

By coincidence, I am editing this on Gandhi's birthday,
Oct 2, 2015; he was born 150 years ago.
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