

Posthumanism: An Introduction

Professor Pramod K. Nayar

Department of English

The University of Hyderabad

Lecture 09

Lec 09 : Critical Posthumanism. Genealogies - 3: Consciousness and Cognition Studies

Mohan Nair of the Department of English and here we continue our exploration of the principle-critique genealogies of critical posthumanism and having looked at the critique of humanism, the animal studies contribution to critical posthumanist thought, this one, this particular module session is devoted to consciousness and cognition studies. The first major revolution in thinking about information flows, feedback loops, and cognition came in the form of this discipline called cybernetics. Principally organized in the MESI conferences, it thought about information loops, how science systems operate, how information travels, and involving some of the best minds of the time, Gregory Bateson, Norbert Wiener, Claude Shannon, Margaret Mead and others, new theories of cognition and information processing were floated. Over a period of time, the MESI conferences were from 1943 to 1954.

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The first major revolution in thinking about information flows, feedback loops and cognition came in the form of cybernetics.

In the Macy Conferences (1943-1954), Gregory Bateson, Norbert Wiener, John von Neumann, Claude Shannon, Margaret Mead and others, ideas about the feedback loop and new theories of cognition and information processing were first floated.

Later, a second-order cybernetics in which the focus shifted from individuals to social systems emerged with the work of Heinz von Foerster and Niklas Luhmann, the later work of Humberto Maturana and Francisco Varela and Evan Thompson.

Together these ideas not only enabled the building of larger and more powerful computers, they also informed ways of thinking about consciousness.

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Later, a second order cybernetics began to appear and their focus shifted from individual to systemic information flows as in entire systems of information flows that brought

networks together and how subjectivity and other things were created as we shall see in a little while. People began to speak about entire social systems and critics like Nicholas Newman and later the work of Humberto Maturana, Francisco Varela, Ivan Thompson and several others started thinking about consciousness, social systems and information processing together. So what you need to see here is that the flow of information into a system and out of it, the flow of information within a system began to appear as an explanation for the rise of not only machine consciousness but perhaps as people will eventually argue of human consciousness as well. So information flows then becomes the

foundational premise of many theories of subjectivity that will follow over the next few decades. It will also lead, of course, to the construction of bigger and more powerful computing systems. So, cybernetic theory first. Cybernetic theory defined the human as an information processing entity. It argued that

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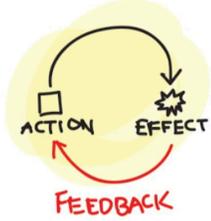


Cybernetic theory defined the 'human' as information-processing entities driven to communicate. The focus was therefore on the flows of information and its patterns.

It declared consciousness, cognition and perception as constructed and as the *effect* of an information flow from the environment, and contingent upon the feedback mechanism, upon a process, rather than material or structural elements.

The focus on information flows across human biology and the environment, machine and man

- struck at the idea of a unified and self-contained human,
- proved that the human's boundaries with the world were not sacrosanct,
- treated the human as embedded in a continuous feedback loop in which information flows into, out of and across the human and the environment



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The human is driven by the need to communicate and so the focus of attention must be on the flows of information and the patterns of information flows which means to say if the human being is a system driven to communicate then it is in an automatic but regulated connection to and embedded in networks of information flows. This also means as you can see, as you can imagine, a huge change in the way we conceptualize the human because We are now thinking of the human not as a coherent autonomous entity, but one that is connected in a sort of information loop with the rest of the world, embedded in a system of information flows and exchanges. This is a radical departure from the way we have envisaged humans all these centuries.

And if you remember, this is precisely what critical posthumanism set out to do, that the human is embedded in a network, that the human is not an isolated entity, not a coherent self-contained autonomous organization, but one who is embedded in a whole network, a whole rhizomatic network of other objects, of processes, of flows. In the case of cybernetic theory, they said, the human is embedded in information flows and this becomes the defining moment of sub-organic theory. And therefore consciousness, perception, cognition, all of these are the effects of an information flow. They are the effects of an information flow from the environment into the human.

It is dependent upon a feedback mechanism. It's upon a process rather than material or structural elements alone. Which means to say that if an organism is embedded in an information flow, information enters the system, information leaves the system. And the system is organized around this process. It's not only that it's a mass of bone and nerve and muscle.

That the body, as in the human body, is organized. Embedded in a system from which information enters the body and leaves the body. And this is a continuous loop. It's a continuous process. So the focus on information flows across human biology and the environment, across the machine and humans.

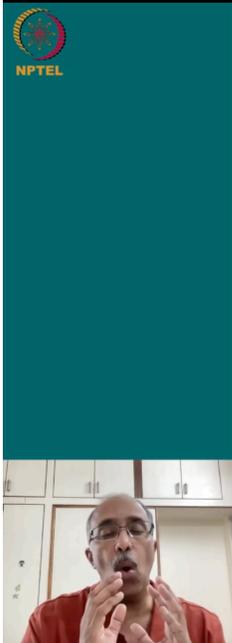
In very post-humanist terms, it struck at the foundation of the idea of a unified self-contained human. It struck at the basis of the self-contained, the autonomous, self-organized human being. Because it said, effectively, the human is part of a network. The human is embedded in the network. And whatever is happening from the environment passes into the human being.

And the human being responds. So we were looking at a feedback loop. environment to the human, human to the environment, environment to the human again. This is crucial because it's not about thinking in terms of or talking in terms of a unified human being. It's speaking about a human being that is in a network.

And this, as you might recall, is central to critical pessimist thought. Such a focus on information flows demonstrates that the human boundaries with the world, with the environment, are not sacrosanct. The human being is not bounded by skin, by the bodily structure, but is always connected to the larger environment. This is an important shift in the way we conceptualize the human itself.

Finally, of course, the argument that the human is embedded in a continuous feedback loop. Maturana and Varela argued for something they termed an autopoietic living system. An autopoietic living system has very clear boundaries that separate it from the domain. So it is, in one sense, an organized system, closed off, you know,

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Autopoiesis

- An autopoietic living system has identifiable boundaries that separate it from its domain or environment and every system strives to maintain its 'organization'
- The system's properties are not the effect of the individual components of this system but rather the effect of the interactions of the components (the boundary itself is the effect of components' interactions).
- These interactions also, often, change the components of the systems in what is known as 'emergent' behaviour.

An autopoietic system is organized (defined as a unity) as a network of processes of production (transformation and destruction) of components that produces the components that

1. through their interactions and transformations continuously regenerate and realize the network of processes (relations) that produced them; and
2. constitute it (the machine) as a concrete unity in the space in which they [the components] exist by specifying the topological domain of its realization as such a network.

Maturana and Varela

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The system's properties, and this is important, are not the effect of the individual components, but the effects of the interaction of the components. Which means to say that consciousness, or any of the processes which keep our body going, is not the result of individual elements, but the continuous process that connects those elements. how they interact with each other, what effects they have on each other. So any system works to affirm the principle of sharing this information and whatever it produces. What the autopoietic system produces is emergent behavior, which means to say that behavior emerges from systemic behavior.

interaction of the various components of the system, not by virtue of several elements at various places, but how they collaborate with each other, how they exchange information with each other, how they interact with each other. So the autopilot system, which is defined as a unity, is a network and a set of processes which produce some components and destroy some components through their interactions. They regenerate the network. They regenerate the network of processes.

The machine is a concrete unity in the space in which they exist. But that unity is catalyzed through this process. Which effectively means that process becomes more important than individual components. The interaction becomes more important than the individual components. When we read contemporary feminist post-humanists such as Rosie Braidotti, Karen Barad and others, they will speak of intra-actions.

Intra-actions even in the non-living, even in non-animate or inanimate matter. And it is the interactions of, say, molecules or electrons, forces strong and weak, that produce a certain set of consequences or effects. What we have already seen is called an emergent condition. So what does this have as a consequence for post-humanists? Contemporary

research, especially within neurobiology and others, has moved beyond the brain-mind model of human consciousness.

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Contemporary thinking and research has moved beyond the brain-mind model of human consciousness to propose an embodied consciousness that is dispersed. For the posthumanists, this has been a major shift in thinking because it does away with the mind/body dualism but also refuses a centralized mechanism of consciousness that has been the foundation of liberal humanism.

Recent research demonstrates that intelligence is not only embodied, it is also environment-dependent. Neural 'minibrains' work best when they are able to collate information from other 'minibrains' to which they are connected.

Consciousness depends on the body's interactions with the world.



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It's not that the brain is the sole source of consciousness, that the brain is the repository of consciousness. Instead, what contemporary thinkers argue is that consciousness is embodied. Consciousness is not in a centralized location like the brain or the mind. But consciousness is distributed. So two things.

One, consciousness is a body. That means consciousness demands and requires a body as in a corporeal body. And two, consciousness is distributed. It's not located in one centralized location. This means that

If it is distributed, dispersed, the idea that the human being is a coherent autonomous agent is also demolished. Simply because, as contemporary research shows, if consciousness is embodied, it means that like the body, it is also environment dependent. People now argue, critics now argue that Our biology of thinking consists of what they call neural mini brains. They collect information from many mini brains and consciousness emerges.

Which means to say consciousness is not just what's going on in our brain or our minds. It is the result of the body's interactions with the world. If consciousness is distributed and embodied, the body is in the world, right? The body is not locked away from the world. The body is located in a certain ecosystem, in a biome, in a network.

The body receives stimuli. That stimuli comes in the form of and is transmitted as information. It is transmitted to the brain. There, it is reprocessed in a certain way. And it begins to develop into what we call a thought.

A thought. Which means consciousness is also an emergent phenomenon. Consciousness emerges through the interaction of various components. And all consciousness depends on the body's interactions with the world. So, two levels here to think about.

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consciousness is an emergent condition contingent upon

- (i) the interactions of the various distributed organs with the environment;
- (ii) the interactions of these organs amongst themselves and with the brain.

The posthumanist vision of human embodied intelligence that draws its 'selfhood' from the sum total of the interactions of its parts within an environment. Rather than self-contained consciousness, posthumanists argues that consciousness emerges within an environment and through distributed, beyond-the-brain networks.

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Consciousness as an emergent condition depends on the interaction of the body and its various organs with the world, and the interactions of the organs amongst themselves and with the brain. What do I mean by this? It means consciousness happens or occurs because the body interacts with the world. This interaction is converted into information. I'm being very simplistic and reductive. Neurobiological sciences are far more complicated than I am able to communicate in this short episode. So please bear with me if I sound too reductive or too simplistic.

I'm sure the neurobiologists will have a fit when they listen to what I'm saying. But the body is embedded in a world, in an ecosystem, in a biome. The information comes into the body. The body takes that information and transmits it through various means to the brain. The brain processes it, and consciousness emerges.

Which means there are two kinds of information that are absolutely crucial. Two kinds of information exchange and interaction that are crucial. One, the body's interaction with the world, and two, the interactions amongst the body's elements. Nerves, chemical

receptors, the brain, the nervous system, etc. So the world into the body and what goes on internally within our body, all the way to the mind, down our nervous system, etc.

etc. That's how consciousness emerges. Which means also as you can imagine consciousness is the result of a series of interactions. The post-humanist vision of human intelligence therefore proposes that any idea of yourself, any idea of who we are, is the result of the sum total of the interactions of its parts.

So it's not a self-contained consciousness. It's not an isolated consciousness. Consciousness emerges within an environment and is distributed beyond the brain networks. That there was consciousness that arose as a result of all these processes, all these systems of exchanges, information flows, etc. Which means also that consciousness is a very intricate process.

It's also the result of multiple components. the world, the human body, and the various parts of the human body. People now increasingly speak of non-conscious cognitive processes, which operate at the level of the nerves. It is essential for the consciousness to function, but we are not aware of it. And they speak about it, Catherine Hales and others, Damasio speak of it as the unthought.

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Consciousness is therefore the interaction of multiple components of the human with the world, even as the world is produced for the human due to this consciousness.

But research now establishes the presence of nonconscious cognitive processes, operating at the level of neuronal processing, 'inaccessible to conscious introspection but nevertheless essential for consciousness to function' (Hayles).

Nonconscious cognition is the 'unthought' (Hayles, Damasio)



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The slide features a dark blue background with white text. On the left, there is a vertical teal bar containing the NPTEL logo. On the right, there is a square image showing a network of glowing blue neurons. At the bottom, a dark blue banner contains the title of the lecture in yellow text. A small inset video of a man in a red shirt is visible in the bottom left corner of the slide area.

As in, what kind of thought are we not conscious of? And it happens because of information processing, information exchange, continuous feedback loops, and so on and so forth. So, Well, for example, we can see something else as a good example of this emergent consciousness as an emergent condition. And this is in the work of mirror neurons.

Mirror neurons, as Christian Keysers and others have argued, are neurons in our brain that help us learn through imitation. For instance, if you see me pick up a phone, for example, you see me pick up a phone. Your brain tells you that is how you pick up a phone. Remember, as children, we learn by imitation.

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When we learn by imitation, and we understand others' actions, it is possibly because of the work of the mirror-neuron system. By observing another individual, the fired-up mirror neurons enable one to plan or model one's actions to attain the same end. Often referred to as 'resonance' - when one person's actions in their motor system trigger similar effects in the observer's - mirror-neuron activity is now being seen as a causal factor in empathy. 'Empathic concerns', where one's feelings are affected by seeing the feelings of others (leading to idiomatic expressions about perspective such as 'I try to put myself in the other's shoes'), are perhaps rooted in such mirror-neuron activity.

People around us are no longer just part of the world out there...Through shared circuits, the people around us, their actions and their emotions, permeate into many areas of our brain that were formerly the safe harbors of our identity: our motor system and our feelings. The border between individuals becomes permeable . . . invisible strings of shared circuits tie our minds together, creating the fabric of an organic system that goes beyond the individual.

Christian Keysers

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We observe how people do things, and we learn. Throughout our lives, we learn by looking at what others are doing. So we learn by having the ability to internalize an action and make it our own. So, like I said, I pick up a phone, I raise my hand. You know how the hand is raised.

You know how X or Y has picked up the phone. Christian Cases and others argue that there are mirror neurons that fire, that are triggered when they see an action performed. And they are able to replicate that. It's an interesting theory, more recent actually. It says that we, our brains, our consciousness, resonate with somebody else.

Somebody else's. Christian Kaiser said, and you can see this on your screen, people around us are no longer just a part of the world out there. As he says, the border between individuals becomes permeable. Invisible strings of shared circuits tie our minds together, creating the fabric of an organic system that goes beyond the individual. What is he saying here?

He's saying that we learn because we respond. The people arguing in favor of mirror neuron theory have suggested that this ability to respond and imitate is the source of our empathy. Then, for example, we say, 'I would like to be in your shoes,' or 'I would like to imagine what it is to be alive.' It is a way of empathizing with the other because our

mirror neurons actually reach out. As Christian Casers puts it so beautifully, we are shared, we are permeable, our bodies are permeable; invisible strings of shared circuits tie us.

Neurons do that. So, then the big question that arises is, should we consider consciousness as extended, as moving beyond? The answer is clearly yes. We have to think of consciousness as something that reaches out, as something that moves beyond the human frame, beyond the limitations of the body. Consciousness is not restricted to the brain.

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Should we consider, then, consciousness as extended, as the posthumanists do?

The emphasis on nonconscious cognition participates in the central thrust of decentering the human, both because it recognizes another agent in addition to consciousness/unconsciousness in cognitive processes and because it provides a bridge between human, animal, and technical cognitions, locating them on a continuum rather than understanding them as qualitatively different capacities...nonconscious cognition encourages us to recognize distinctions between different kinds of material processes and correspondingly different kinds of agencies

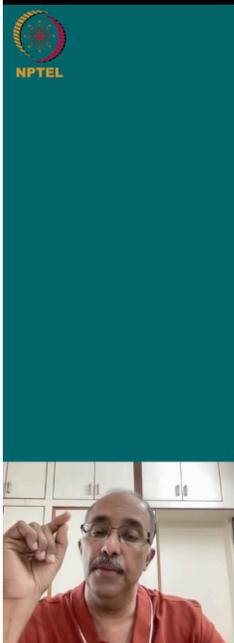
Hayles



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It is a function of an organism, not the function of an organ. Then, the human body is not separate from its environment. Consciousness is not restricted to the mind. Consciousness emerges from very specific conditions. The interactions between those conditions.

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1. Consciousness is not restricted to the brain – it is the function of an organism, not an organ.
 2. The human body is not separate from its environment, neither is the consciousness of/in the mind.
 3. Consciousness emerges from specific conditions, the interactions between and across those conditions.
 4. Consciousness, body and environment are all continuous.
- Robert Pepperell

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Concluding remarks by Robert Pepper, which I'm quoting here: consciousness, body, and environment are all continuous. It is not like there is a body and there is an environment somewhere outside. No, because we're part of it. These shared and invisible strands that cases spoke about are connected. The English poet's arguments. No man is an island. It's illustrated here. We are not. If even our basic consciousness, our learning, emerges from interactions with the world, then how do we say we are independent creatures?

How do we claim that we are isolated, autonomous individuals? We are not. Even our consciousness demands connections. The enactive theory of cognition, as it's called, enactive theory of cognition, like in Anton's analysis, We argue that cognition is not embedded in the organism.

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An enactive theory of cognition (Thompson) proposes that cognition is not embedded in the organism alone, but is the result of the organism being in an environment.

Thinking is adaptive: thinking occurs because of an 'adaptive interaction' between the organism and its environment.



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It is the result of the organism being embedded in a certain kind of environment. Thinking occurs because of an adaptive interaction between the organism and the environment. So consciousness is the result of me being here. Interacting with the world, my body sensing all around me, my fingertips, my face, my eyes, my ears, and my nose, interacting with the world. The stimuli I see get processed, and that's how I behave.

I even learn by that. So when I speak of identity, when I speak of selfhood, one should be conscious of the fact that selfhood is embedded. Selfhood is embodied. And all our consciousness comes from being embodied. It comes from our interactions with the world.

It is not possible to think of consciousness as isolated. It comes from everything. Plants, animals, the noises you can hear in the traffic. Now, as you are listening to this lesson, you are also aware of the fact that your chair is uncomfortable, a vendor is shouting outside, the fan or the air conditioner or the noise outside is permeating into your room. You are aware of all that.

You are aware that somebody else in the house, in an adjacent room, in your hostel, is talking, and at the back of your ears, you sense that. Tell me, where is your consciousness located? When you are paying attention to this particular lecture? Or is your consciousness distributed? The answer is clearly that consciousness is distributed.

Likewise, when you are even on your own, you are taking things from the environment. You absorb what you normally call internalizing. And out of that internalization, the embodied adaptive interaction emerges as consciousness. So, for the critical post-humanists, cognition studies and consciousness studies, these are very important

because they demolish the idea that consciousness is only in our brains, that consciousness is the result of mental and mind activity. No.

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As neurobiological sciences demonstrate very clearly, consciousness is embodied; consciousness is embedded. Consciousness is the result of an information feedback mechanism. It is part of a loop. That's how consciousness emerges. Consciousness, therefore, is an emergent condition.

And for the post-humanists, it means that all humanity and all human bodies are linked. They are networks. They are part of something much larger than themselves. Thank you.