

Indian Institute of Technology Kanpur

National Programme on Technology Enhanced Learning (NPTEL)

**Course Title
Cognition, Transformation & Lives**

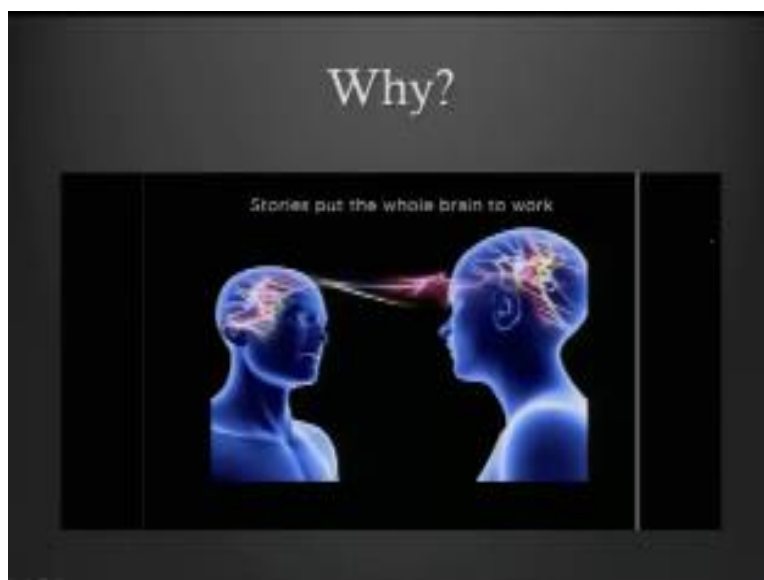
**Lecture – 08
Stories from the Brain – continued**

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Welcome back to this story making session as we talked last time that why does the brain make stories one we said it has to give meaning to every situation it interacts otherwise it will be of no avail whether animals give meaning or not or they just survey in harmony is the big question, so our mind creates the self referential unified self which seems to have a will and has some intent and moves on the world interacting incorporating various experiences and stories in to.

So what is it do it? When people hear stories when you look when you hear, you hear. But you are doing lot of things at the same time but when you look at a story.

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And when you look at the or trying to create a story or if I ask if you ask okay tell me about yourself I would try to weave good story in around myself, I would not just tell you okay and that is if you write a CV and you write your profile there is some difference in to it. So it is not a matter of fact stuff nobody wants to take and that is the reason why cinema and everything so successful because story is what you have formed out that the story is put the whole brain to work.

Remember I told you that all neurons are active all neurons want to communicate if the role of the gene is to create a human being or any animal or plant for that matter and multiply to survive the role of the neurons is to connect to each other and communicate that is the basic need of a neuron. So all neutrons are waiting to expressive, when you tell a story your whole brain gets activated and how does it get activated we talked of cinema or theater or music how does music work? Somebody has decided to sing with a certain role of putting notes in a different order which gives a sensation of continuity and the person sings.

Your ears catches that all that neurons which get activated immediately but even whether you have learnt it or not if you pay attention to it and you are not too upset with something else and you attention camera is directed to that you tend to follow that rhythm how thus this happen it happens because there something call mirror neurons in the brain so mirror neurons are we have broadly think it is an area call insular which is deeply tugged inside.

or the reason why people why this homosapians are survived other species because they learnt to communicate even without language, language came later but our mind our brain knows each other very well it may get lost in the superficialities in your culture in your learner knowledge in your fights for religion and all there are superficial differences believe me. if you are sad even if you do not tell me if someone is sitting next to me and they are sad believe me you will know because you have sadness inside you and your mirror nonce will tell you even well I move my say left hand that means the this front portion of my right brain would have got activated to send instructions for this but the same area of brain in you also would also got activated EEG recordings are proven this.

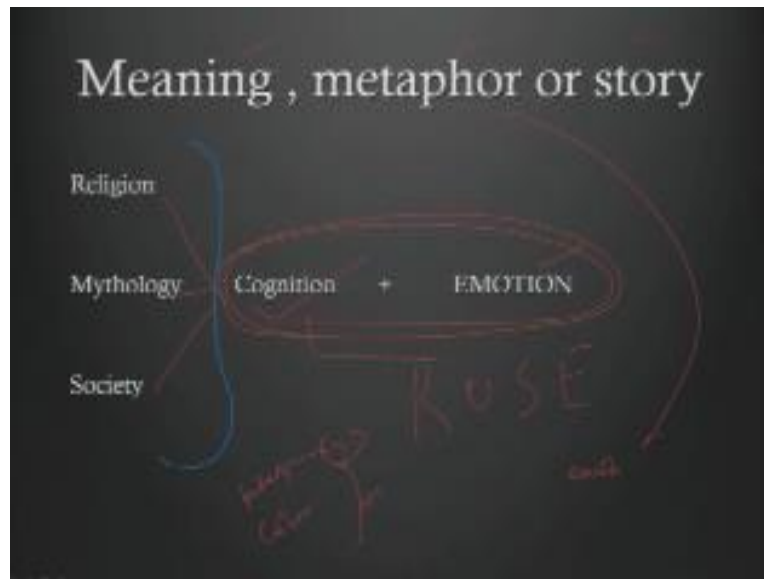
if I am moving this there was an experiment which was done the monkey reaches for banana and this whole EEG recording is being sent to transmitted over internet to far of Tokyo or somewhere else the robot also moves it this is basis of what we are trying to work out as brain computer interface we will just come to it. So this whole area of brain mirror neuron actually makes man the social being and that is the basic need the basic need of neurons is to communicate and connect and that need has expressed in to behavior and human beings also to communicate and connect.

So the best is that all this the brain create the stories all this stories are thrown out in the world through behavior through expression of emotion through relationships all this stories collide conflict fight create new stories and that is the story of human being, whatever we have achieved has come out of the mind in the form of a story or fantasy one mind or collective mind that the execution of it the planning of it is all second and third part of it and that is the push of living together.

So however human being fight however wares we do, they have to belong to something and this belonging is again the base line, so there is a belonging to community society over which the self is moving in to the immediate circumstances and all has to be connected at one large big meaning. So you look at it there are stories of individuals which sacrifice for in story of the family the story of the family sacrifices for the story of the community the community to religion to nation, nation to politics to wars as it grows as we are talking about the brain the information tit bits of information coalesces into making higher complex meaning.

Same is here tit bits individual stories sacrificing in the larger bit of it and that is how neurons do one neuronal activity maybe, so no neuron is free to behave in the way they want so one neuronal activity it scarifies into the larger neuronal system of collective functioning.

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In fact there is a Hebbian theory all the neurons that fired together and wired together they may not necessarily be in one place they maybe scatted over lot of places, but if there is a stimulus they all have to fire together there will be connected in some way of the other which is the social theory also at one person gets connected to a 150 people in an around and each neuron is connected to intervening 2 or 3 neurons this is the whole network of connection of human beings of neurons in the sense of giving meaning to life.

So what is it all about again we are back to our good old friends cognition and emotion so there is a meaning metaphor you know metaphor brain is also specialized but brain cannot go concrete all the time of evaluating each emotion each dynamics and each word and so plus all the information that the brain has to go although it has huge capacities but the information is also humongous. Whether it can really have categories and like for example if I ask you to just imagine rose it is the common word use.

All of you would have different imagery somebody would remember petal somebody would remember black rose somebody would look at yellow rose somebody would remember your love story of being rejected or accepted somebody would remember thorne somebody would miss

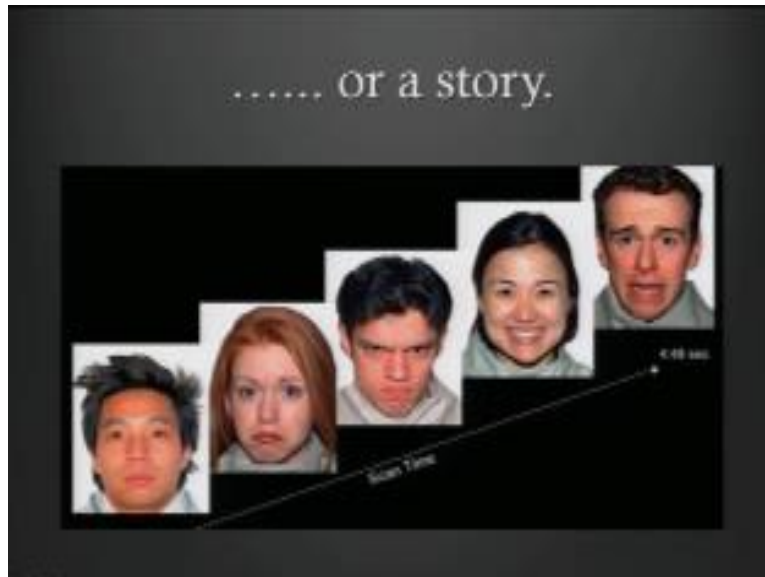
anything you think all this information which we have about rose is not stood in one place one box of rose it cannot happen if how many boxes you will have.

So it is something else maybe we are not able to catch it right now, but may be with all the memories and experience of this one triggered creates a word a pattern of a word call ROSE, it can create imagery my drawing is very bad petals colors thorns emotional experiences, so brain has to create symbols for this. Now you say I gave a rose what is it mean? It is mean I think it is a metaphor, you heard of proverb that is abstract thing.

So brain has learn to create symbols metaphors and it has metaphors about metaphors and all our society parenting mythology religion everything has gone in to it. So if I hold a glass like this, this is not just my 50 years of memory it is a memory of millions of years when I stood up from the all the force to by peddle and my thumb grew in opposition and then hold it like this so this is the memory which has come from culture or biology,. I guess both because if this was better adoptability which started somewhere back then obviously other things had to come which increase the function of this.

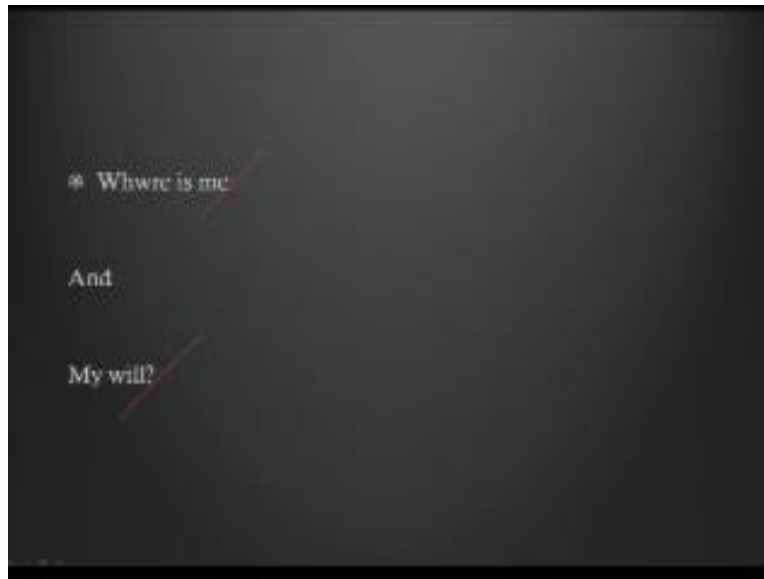
This is how humanity has actually progresses very interesting to look at the whole thing but let us get back to it the whole thing goes back on to build your cognition and your emotion, memory of course is at the background of it.

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So it is metaphors story each one of them of us or self has a story.

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But in the whole process as I talked about that this is the story of self over which anecdotal. Is there a will and what am I? Part of me decides okay I am going to do this but the moment I decide does it go out of my control do my brain areas which want to respond I say I want to pickup this glass and ask for water okay the need will not that is a later thing, the need would be water is this my will which has ask me to ask for water or it is the need I am actually felling thirsty.

So I am feeling thirsty and my brain is immediately thrown it to cognition where it has rationalize at let me give this example of asking water to my audients, so is it my will which just suddenly made me chose this but why did I chose this I could have done this and taken this okay this is my will I am putting it here and I pick it back is it my will to a demonstrate, but I had all the options but I said no give me water with give me water is may be a need a time feeling thirsty who knows? I am actually.

So that is the big question which is still unresolved and that is the crucial question which will immerge when we talk of transformation and that is the crucial question which has not been answer that why in spite of knowledge and everything we still remain like unstable and

measurable and all of us know in our heart. Our heart may try that we have very rational and we do not disrupt we all pretty disruptive animals and we have infinite capacity to travel others and our selves.

So these are the remember this questions because this is where we will talk about and we talk about how cognition and emotion can control each other and unconscious, so we have like a grid now if you want to answer this nevertheless, So you have cognition you have you have emotion have a grid you have conscious you have unconscious and this all boils down to action behavior feedback and then the whole thing may go to memory.

So this is the type of thing where does this figure here will or this is the acting will, so science is divided there is the group of people who think that there is a will because if there is no will then there is no crime either then nobody is responsible for anything and there are people who believes there is no will because anyway your conscious brain knows only what your conscious mind is telling and the push of the unconscious and the processing of the information have anyway as so much that you cannot decide anything.

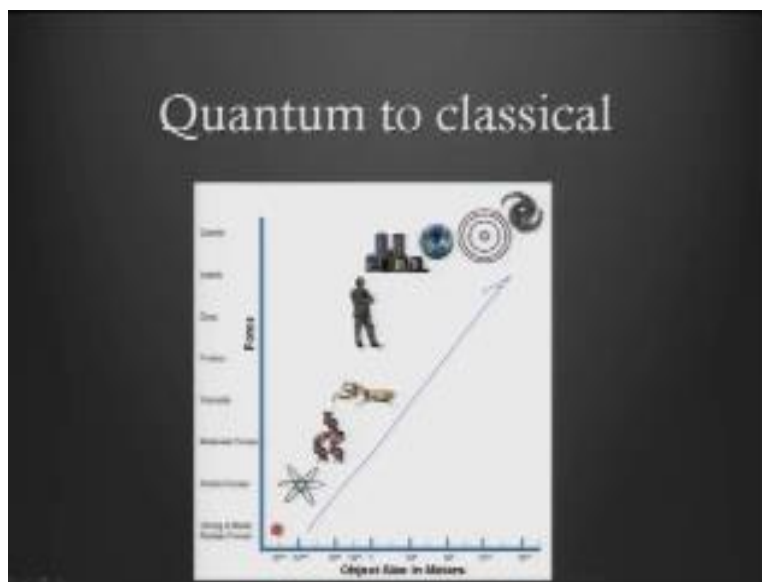
In the poor conscious brain just has to give meaning to whatever your unconscious mind pushes because so it cannot go and alter the unconscious this is the antithesis of transformation. So and just add to it the biology and behavior the physics of it then we have not been able to explain which seem to live in classical world, world of classical physics cause and effect and reversibility and everything but deeper in the mind it does not seem to be classical because I am sure there have been theories explaining quantum processes and nonlinear dynamics world also has all that.

So the world may not be totally deterministic may be random and the probable is in the quantum world in the micro world, and there is a huge cosmic world which has its own deterministic rules between these two is we, are we giving too much importance to ourselves we are just on planet call earth. But nevertheless even if there are other people and we do not know them still we have to give kindness to us being. So the great anthropomorphic theories and religious theories that

the world was created for human beings or human being is a special creature which obviously Darwin's theory through off.

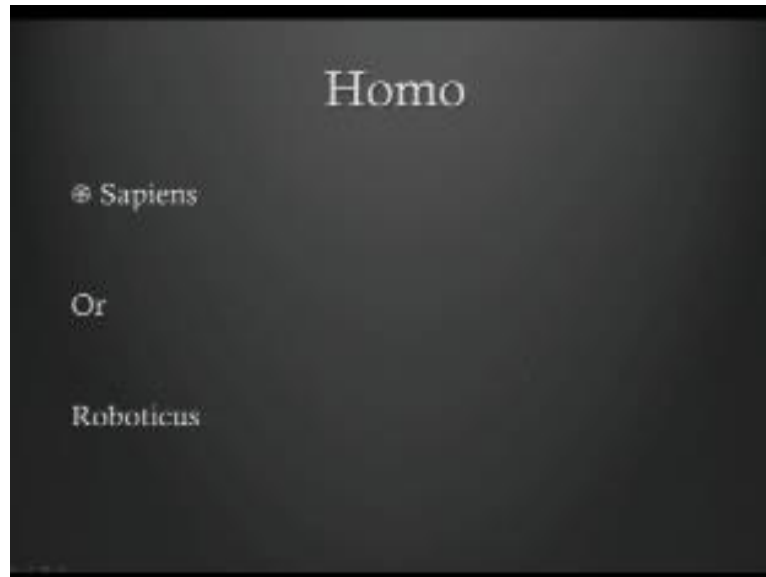
We know what actually we are doing, we again as I said we are giving meaning to our existence we may know the futility of everything but still we have to give some meaning and that meaning is connected to change the situation change and the stories change may be common story, but whether you have a will in that or not is a big question where the quantum has a will electron has a will or even if electron has a will and the American President also has a will. So from we move like this.

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From the quantum to a big classical world and then so on so forth so we have bothered about this, the man.

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That brings us to a very, very important juncture which I would like to discuss it here itself because that would determine what we are going to really talk in the future lectures. And that is the mind always knows that and knew that it is imperfect the mind always knew that even if it is thinking Rationally the emotional pressure may actually destroyed so the latest story which has evolved after making weapons and rackets and trying to explore, it is creating a double self the man wants to create a new story of creation if you remember creation god has made as.

So we want to make something call homoroboticus we are homosapience we want to make of homorobotical we want to make intelligent machines which are perfect we do not want our robots to fall in love we do not want our robots to alter their precision thought process with emotional search you would have a seen film call robot where the robots go out of control and become emotional.

The question is why do we want to make something a machine which is more intelligent than us same brain you think the same brain which has brought us here has evolved on its own till now.

We want to repeat the story of creation and create something else but is the brain which is pushing to create something else why is it, does it want to play enact God could be and this throwing of speculations or is it that the brain is capable of knowing its deficiencies and wants to create a perfect machine in the process find out what are the philosophies which has making may weak, so the race is simple..

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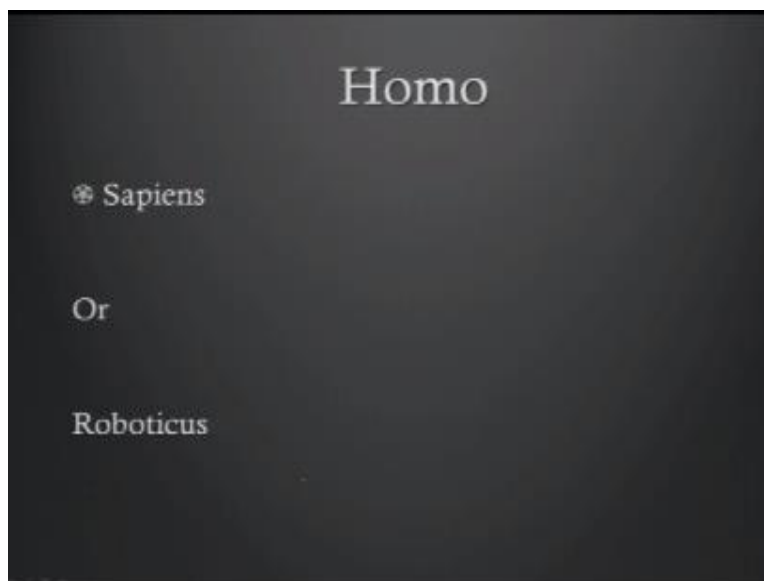
So we have brain like computer, like we said brain mind mapping, brain prosthetics, interfaces so you pick up EEG waves and somebody who has the paralysis and if his hand is not working we put something some artificial contraption pick up his EEG waves because the brain wants to move and transmitted to it and it will move these are all the machines brain computer interface is work on this, because mirror neurons works someday may be I think and that EEG waves can be transmitted to you think the same thing may be mobiles will go off .

You can just is it sounding it like mythology because our mythologies were talking about all this and that is the reason were people were said that okay whatever is been done its already been done here but we don't know whether the science was so advanced at that time that they could

communicate with telepathy now let me warn you all this parapsychology of the telepathy intuition we may reject it but let us not be very very arrogant about it because we have not been explain all that and my guess is that to explain all that we will require some of another amalgamation and another emergent physics which can put the things together like this but till that time all science is about utilitarian and we all helping people with disability we are helping people with movement problems, put a peace maker which can keep sending in pumps of neuro transmitter in move in like in parkinsonism disease.

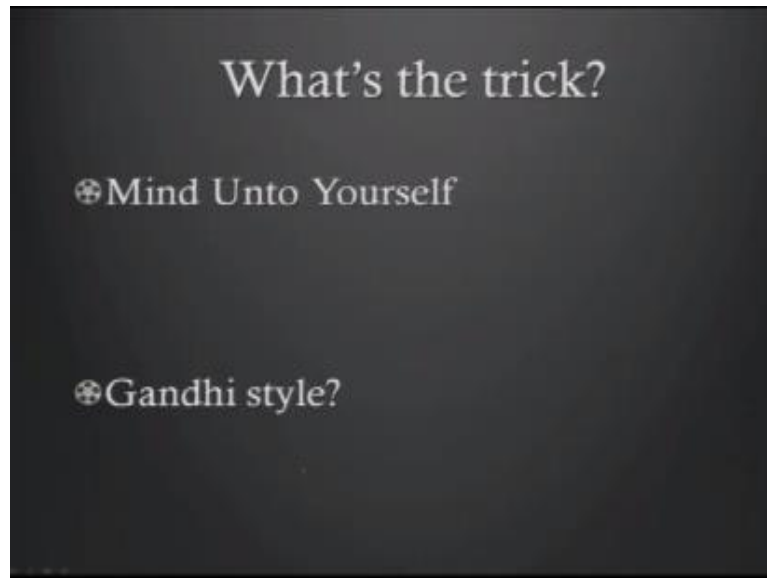
Some they will be able to help people who were dyslexics were not able to make the patterns of words may be will cash their process of pattern formation and then help them so this is just, but the biggest question is.

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Ultimate ambition lies is in making a perfect machine which is not shackle with emotion because the emotion troubles us all whether the brain as I said is an ambition of you to have brought feeling or the feeling risky in the process the same mind which is creating it will observe this process of this perfect machine will going on and try to transform it so I think.

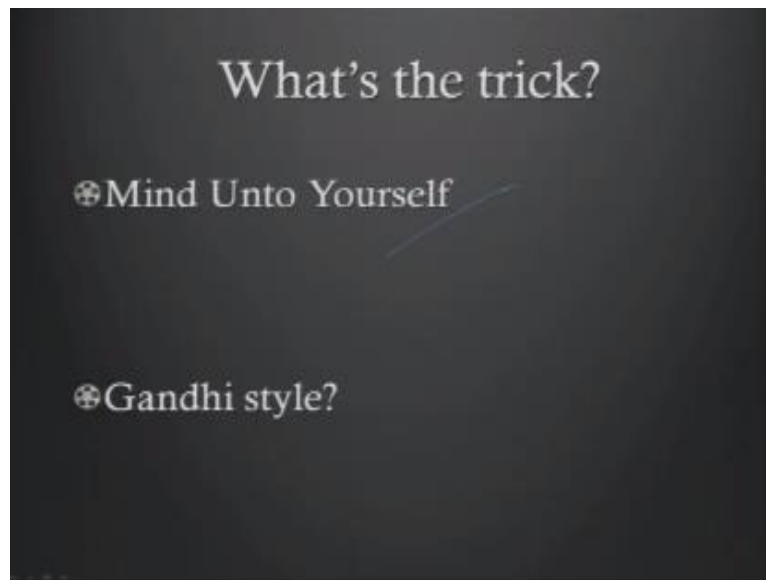
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These is the race and the race is not race in a competitive sense but the brain new story is a trick and the trick is that while it is trying to create a perfect machine ,which has the precision because we know our processes may be very precise but they do not turn in to the precise behavior and because they do not turn in to precise behavior because emotion come and rattle it because we do something which is not fitting with the society are rebelling against it or even while you follow society tend to suppress yourself .

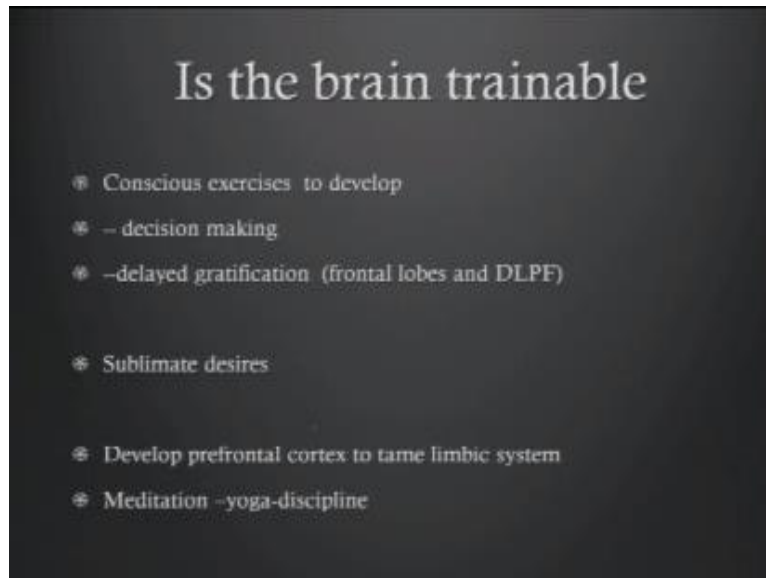
So all is not it well in there, that impression the brain wants to overcome, if it see externally machine which the brain has created and catches that point can it train back itself ,so mind in to your self .

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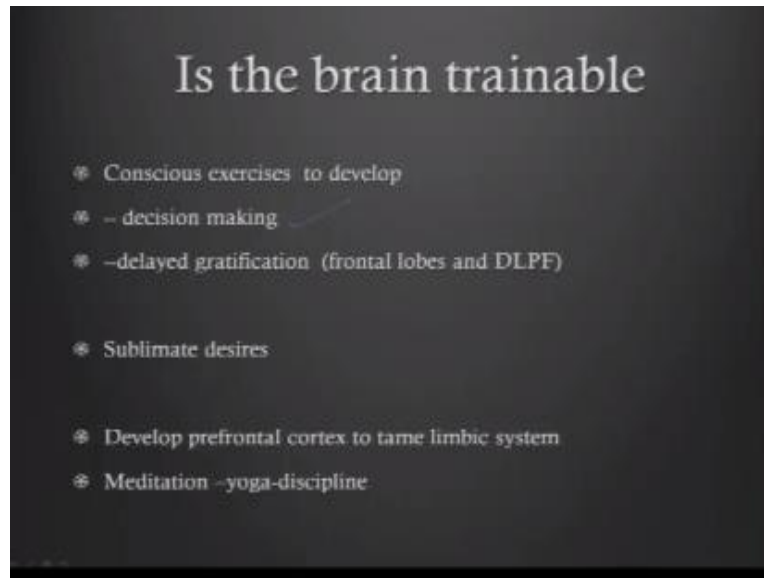
this is the basis of all children transformation in Gandhi we will talk about Gandhi as we move on.

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So the big question where I like to end this talk is which I want you to think back so that we will come back and we is the brain trainable that means what you think your cognition is higher you want to control your emotions not allow them to disrupted are you want to find out how many between cognition and emotion or you want to allow emotions to whatever.

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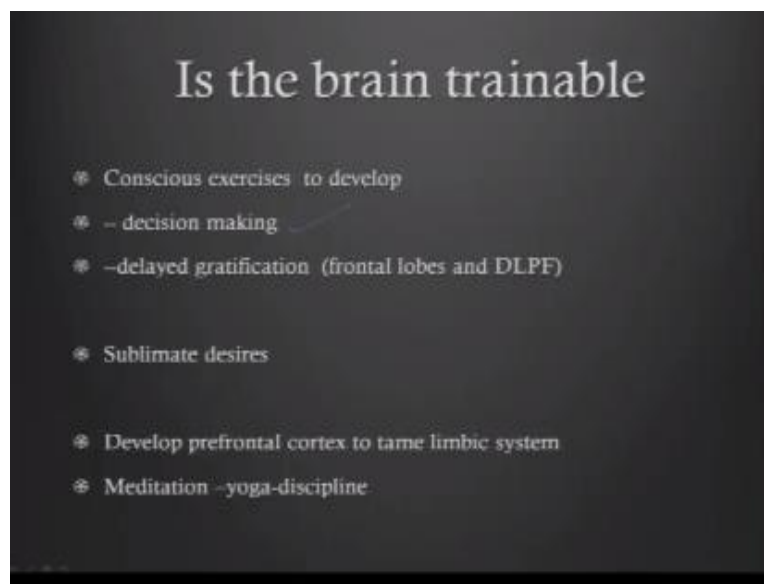
Decision making, delayed gratification so the certain areas of the brain call frontal lobes and dorsolateral prefrontal cortex in fact evolve very late around 18 20 and these are the areas of brain which are actually the controller they inhibit lot of this impulse emotional upsurges from the brain and they keep the brain in to correct reality check interface with the survival adaptability they are the central executive network, the three networks one is the central executive network, there is a salience network.

And there is a default mode network these are the connections from the brain central executive in the planning, judgment, decision making, execution and abstraction even the feedback salience network actually works as I said that information goes in it has to been evaluated the threat and the specifics of the stimulus to compared with the memory .

Default mode network is when you are not doing anything, if you close your eyes and sit it your brain would still be active and lot of stimulus are still be going in, the brain will still be

integrating and integrating all that information in to your existence either in memory and all but the frontal lobes and the dorsolateral prefrontal cortex are the places which have to really control the animal instinct and that is probably explains that first thing which I asked you to why do people get violent and when they are psychotic why do people behave in the certain way and when they are under the influence of alcohol why do they behave in the way they don't want to and the other people don't want them to.

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So, can the brain learn to do decision making consciously delay the gratification which they already evolution has brought it sublimate desire take your desire you know which way you are going and put it into art form and all .develop the prefrontal cortex to tame limbic system we know all this meditation, the yoga, discipline and lot of all other things. so we will wrap up with this and I would what will you do next I will leave out this question and I want you to think .so that in the next lecture we will pick up so you know what is the brain does.

So what behavior becomes normal and what becomes abnormal how do you really judge it what is normal and abnormal so we will have a look at this and then we will take an example of addiction with this is one of the big thing the people still has no treatment and the people want

not only meditation but lot of all other things to go and sometimes it is a moral issue, some time it is a medical issue there is lot ambiguity about it.

So we will take that as a case study and then following that we will talk about some live models of transformation whether it can happen so the basic question remains as I said is thus the end question is the brain trainable? We will pick it from there next time and or rather may be after the next lecture and the next lecture we will stick to and see what so everybody things they are normal some people we call them abnormal.

So how does the society actually created this setup of the calling people abnormal and normal and whom do we call and whom do we ask to change and whom do we treat where do we expect that people should be consciously doing this taking their morality and all these issues are important because ultimately when you think about it towards the end then these issues go on in our mind whether it is abnormal you need treatment or you need some moral transformation so I will end it here and then we will catch up in the next lecture picking upon these issues thank you.

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