

**Indian Institute of Technology Kanpur**

**National Programme on Technology Enhanced Learning (NPTEL)**

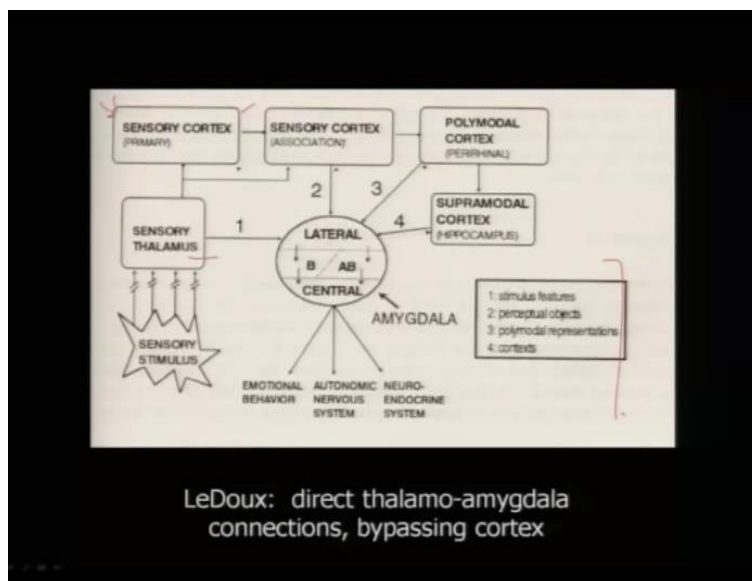
**Course Title  
Cognition, Transformation & Lives**

**Lecture-06  
Understanding Emotions**

**by  
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Welcome again, so I will just begin from the slide where I left last time, so these are again, these are brain as you know is a multi-modal organ modular rather which has a specialized areas, but all these specialized areas do not work in isolation, they associate with each other.

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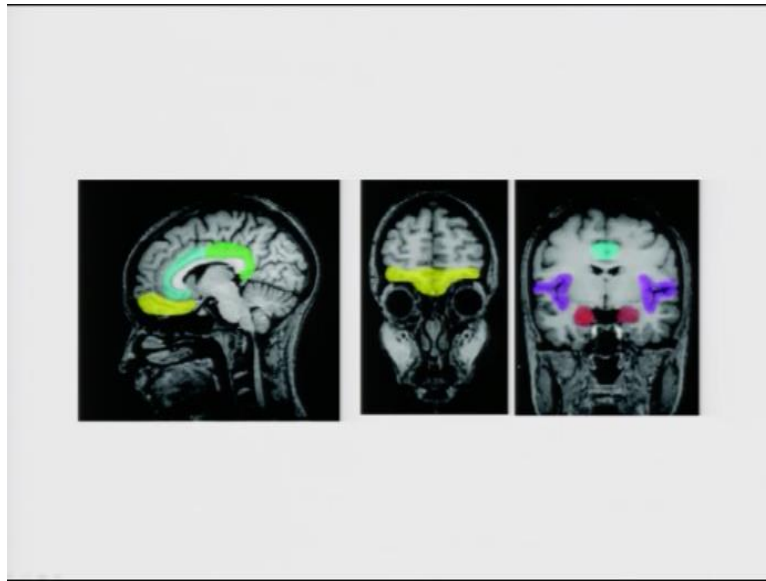


And at a same time it is hugely parallely distributed is not that you are hearing at one point and then you are looking at other point and feeling at other point this all goes parallely, lot of data goes into the brain all the time and as we go up this is coalesced into certain, is liaised with

emotion and finally we will talk about it when we talk about how the brain actually builds up the whole thing.

But right now amygdala as I said is considered to be the center of all emotional expression, emotional behavior, autonomic nervous system as I said involuntary control of lot of stuff what you feel. And endocrine system which releases the stress hormone especially something like cortisol.

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Again this is the imaging.

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### Bower's Network Theory ✓

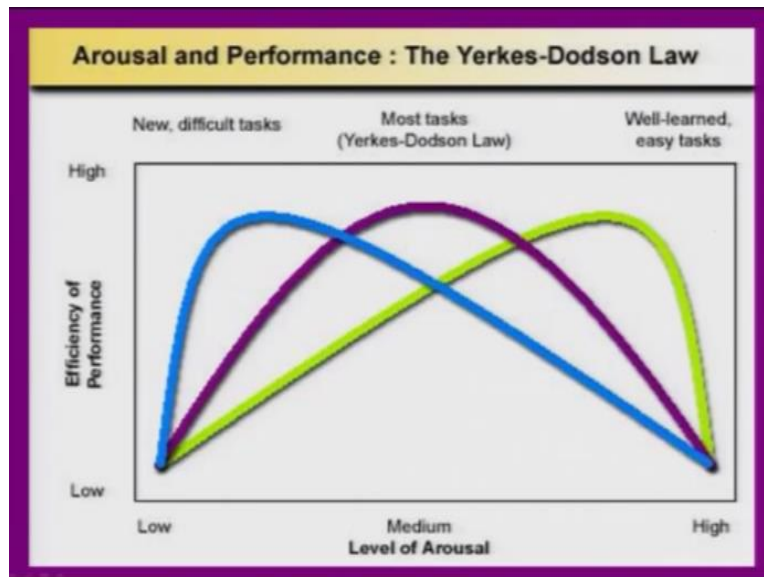
- Emotions are nodes in a semantic network
- propositions ✓
- activation of network ✓
- Activation spreads in selective fashion to associated concepts ✓
- When nodes activated above threshold level, conscious experience of emotion results ✓

This is one of the theories which probably tries to explain in a more comprehensive model of what we are talking. Bower's network theory which says the emotions are nodes in a semantic network, semantics as you know making meaning of the whole thing, so and that is whatever is our mind doing, trying to make a meaning of the whole thing. There are nodes in a semantic network they are like propositions.

So when there is an activation of network they spread in selective fashion to associated concepts, and when nodes activated above threshold conscious experience of emotions results. So what is exactly happening is, there is a whole network right from what you see through your senses from your environment it has to reach a final thing where you have to have a conscious experience and in the process the emotional nodes get activated.

So nothing reaches your brain conscious mind which has not touched the emotional center. So absolute emotion has matter of fact, knowledge, objective probably it does not exist, because in whatever process it goes, it will touch the limbic system and some node there which we will insert its own meaning in the whole thing.

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This I talked about one of the lectures that this is Yerkes-Dodson law. It is related to anxiety actually level of arousal, you know little bit of anxiety is very good, if you do not have little bit of anxiety you would not study or you would not push hard to achieve and its happy or lucky. So little bit of anxiety is important to get up in time and you really reach wherever you have to perform your duties and that is how the world goes.

But a little bit is good, if it goes beyond this if performance actually dips down and as a student I think all of us would have experienced this, what we call a performance anxiety. You have prepared, you prepared well for your exams, and maybe by some core go some discussion or suddenly some thought gets into your head whether you will be able to pass or not and just one day before your mind actually starts working on to this thought of whether you are being able to do or not do and.

So by the time you reach, so little bit is fine, because if you feel one day before that okay you are not fully prepared and you will not get desired marks, so you push yourself, take up your book again and you reread, practice. So you practice you reach here, efficiency of performance, but

what you do not know is this threshold. And the moment it goes beyond this your performance dips down.

So little bit anxiety is better, rest is performance anxiety and when you see the paper and by any chance if you cannot get into the first question itself or your mind just suddenly goes into this anxiety, so you know what happens, your mind goes block that is how anxiety blocks, performance anxiety all of us have experienced it. So what is the importance of all this, we talked about cognition last time and now we are talking off, let us just collect the gist of the whole thing till now.

So self gets born with your neurons, your neurons are in place when you are born social cultural conditioning helps you make networks, help you make learning layer after layer right from survival to knowledge, to religion to myth to how to behave which you get input from your parent and you want to condition your mind to how you should behave in certain situation and knowledge base keeps changing as we learnt in the piaget theory, whether it is phasic or like it is a continuous phase, you keep modifying knowledge to assimilation and accommodation.

And that is how your thought develops thinking and thinking has it is ultimately its own component like abstraction, like judgement, like problem solving, or whatever way you are using it. And so obviously the natural corollary of it was through psychology and through ancient literature and everything, and the natural corollary was that if it is thought and if the cultural conditioning makes it and if, your basic template is there and over which you can train.

Then obviously man is a part of society and man is with nothing without society, so society can train man. So how do society train, if you look at the history it wars, and fights and conflicts where if you people even writes peace time history, but lot of development has happened in the peace time, but so is when it the development happened with wars, because the necessity of war into necessity of survival actually can iterate lot of thing, lot of progress and modernity, whether good or bad.

So then there was a parallel history, the people always kept questioning about the basic aim of life and obviously people must have got bored of the daily grind and they all move forward and that brought a lot of teachings, and religion and self-help gurus and of the modern times, meditation, yoga, India we know how it goes. And people go to temples, to mosque, to church and they have their own gurus and if they cannot, then they obviously go and have a psychotherapist if nothing else.

So what is, while the mind and cognition is growing, that need for change is always there? That seems to be the pushing force of human life that they want in spite of the brain developing there is something else which the mind is looking, may be possibly as we have discovered that there is something else which keeps pushing and that is emotion. So when we think we think, may not be actually so much as your mind is being directed by emotions.

So emotions often lead to behavioral changes which may not be perceived by the other as being very conducive and that probably creates conflict, and this, the whole conflict itself is a big motivation for need for change. And that is where probably all that was start always insisted on changing the thought, but our people able to change the thought, and that is what we have to discover, before we jump on to this, what is actually happening in the brain and why people inspite of knowing what is right, we all know do not we.

As I said this whole lecture series will be more of a discovery of self, you know that what is right from wrong unless we have been totally indoctrinated like some terrorist may be that the suicide bombers even they have been indoctrinated but to nobody as actually talked to them and it will be interesting to know whether they know what they are doing they are not so deluded because if they are really psychotic they would not be really so smart to walk the way through and do all this damage and fooling all the intelligence agencies and all.

So obviously they are smart their intelligence and the cognitive skills are working perfect and emotionally also they are so charged to talk this major discussion of killing one self I am just talking this as an example, it would be interesting to know whether they know the right from the wrong but let us forget rest let us look at our own life just introspect because after all when you

talk of transformation latter it will be about us if do not we know as students that we should what is the right way to study where should over energy be directed.

Ages from ages students have been told do not do this do that the whole list of does and don'ts they have been periods of rebel they have been periods hippies where students did not want to listen the students these days also have their opinion they know what is to be done, but still most people fall short in our own life especially when you talk of say an issue like corruption which effects our life's I am just trying to relate all this life to biology to neuroscience.

And but I am saying this I am not saying that all this things which are involuntary control should be excused and there should not be any law because it is biology which is determining my question is if people know what is the right and wrong you known that you should not get too angry or too irritated with things which are beyond your control or even on silly things.

But see the number of times we do it and all that irritability all that anxiety of living and all that rather conceptual sort of misery is in all of us it is actually increasing if you look at it the more materialistically comfortable we are becoming the more irritated we are becoming isn't it so happiness become something to you achieved and you work hard to achieve happiness why so what is it in our heads that does not allow our right thought to prevail and actually do what is right.

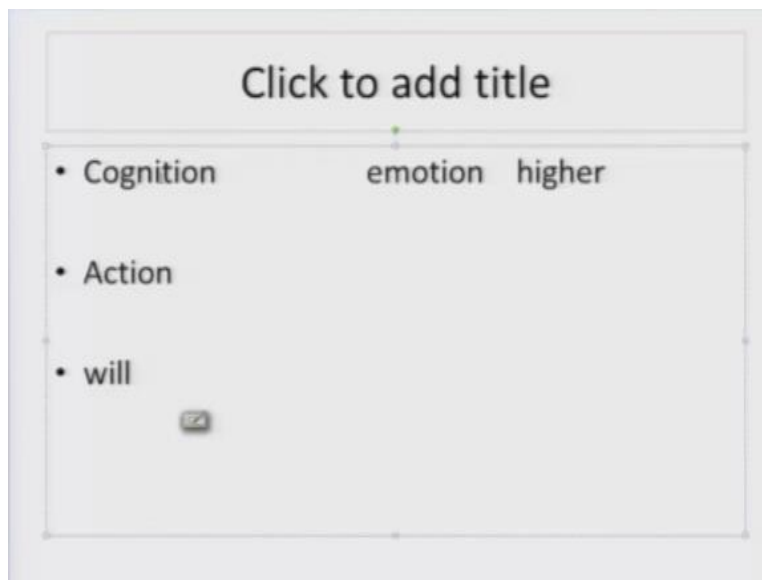
So I am not saying that it is should be done because obviously if it was happening I would not be talking about transformation and cognition they would not be so many self help books and there would not be people getting worried about how they want to change and people want to change a student wants to study well achieve get a job become a big short or whatever you wants to and then at 50 suddenly you want to leave all this and go.

It is this felling of leaving and going I think Gautama Buddha he did it so Ram was sent to vanvas so this is nothing new but see the logic every working towards certain things and when you achieve it they are not happy, why is it happening it is happening probably because the brain is wired in such a way because what you think in isolation it may appear very nice but it is

always covered with the basic need for survival the basic need for power the basic need for emotions.

So emotions what we think are just expressions of a certain state or certain perception of a situation may not be so actually the possibility is it is the actually the emotions which have a need which they manage through cognition I am just telling a reverse thing both are possible are they may both be standing somewhere in mid-way and asserting the whole thing.

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What I am trying to say is this cognition which is thought and there is emotion and which is a mental stage which gives you a sense of basic feelings happiness, sadness, disgust, lust and or you have so there you have higher emotions the big question is what I am trying to tell you is that between this which is higher we think that cognition is higher cognition is thought and that is why it should work it does not seem to work.

Thought always just not seem to work why and we think because what we think and we act there are two other words which are very important action and will so we think that there is action what we think we think we act and whatever emotions are generated is the feeling of reward



which is partially true but in the process if you remember we talked last time it is the dopamine which is pushing you to explore.

So is it possible that it is actually the emotion which make you think and emotion which makes you act and then you think about it the Freud would have believed it he said we are not rational beings we do certain things and then we rationalize it we make a meaning out of it we will discuss about it in the next lecture but then where does it leave the will if I can think an I can act I can choose that mean there is a will we are not able to achieve what we think go much under our bench marks is probably because the emotions may be they are going in different direction.

And the emotions itself may be the basic reason of pushing you towards certain action in that case will becomes a, will becomes secondary to emotions and cognition this is the debate in which neuroscience is still engage that what is higher there are people who say it is the cognition and there are people who say it is the emotion which is actually doing the emotions have always been there in our existence.

But there are new entrant into understanding of our but there is and a different approach to the whole thing and that comes from our culture and I should I think I should mention it there is something called rasa theory.

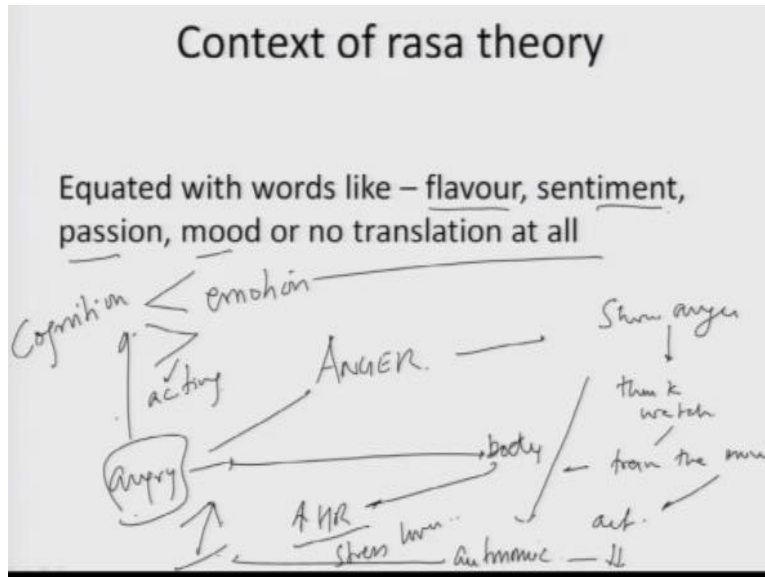
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**Context of rasa theory**

- Rasa theory finds its root in late vedic period in Atharvaveda ( 200 BC-100 BC)
- ✓ Bharatmuni (First century AD approx.) gave major statement in his Book Natyashastra
- Natyashastra* is Indian treatise on the performing arts, encompassing theatre, dance and music

Which was mentioned first time in Atharvaveda it is so old and but the real proponent of it was Bharatmuni there is a famous treatise he has given Natyashastra it is the art of the theatre Naty as you know it is on performing arts as and everything about theatre even right from the way theatre should be built to the acting to emoting to anything which goes on the stage there was no cinema at that time.

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But what is rasa what the western psychology as talked about as emotion and I split into primary, emotion and higher complex emotion like love and altruism and all that this is not exactly translates into emotions because it is not that concrete it is slightly more complex dimension of emotion it has been equated with words like flavor or a rasa, essence, sentiment, passion, mood or may be nothing.

But are not these words which we use why I am insisting on and understanding this because by the end of it we should be able to know what cognition and emotion is, so when an actor for example considering yourself as an actor and you are supposed to go and given interview, so obviously you would have prepared your mind for it you would have prepared for your knowledge base your dress and the way you are going to behave the way you are going to talk.

You would have done it with your thought isn't it, but when you are going to the interview your mood state and how you are feeling is it in your control so you are acting in the world and may be your part of it is not in your control but look at an actor look at any great actor from Hollywood to India, look at Mr. Amitabh Bachchan or Mr. Al Pacino or they if they are doing a role of angry man obviously they would have a practiced with their thought and they train it.

With a dialogues and the way they are going to walk and they the way they it is all practiced is nothing natural Amitabh Bacchan is not what he is on the screen but is it that is it just that he would not appear angry young man if who would just have practiced when you remember the dialogue and the way of walking his whole being has to go into it and where is that being that being is the very interesting thing, look at it.

If you remember just go back few slides you look at it there is a facial display I was talking about in a starter reflects their whole body was there so in all emotions the emotions are not separate from your body a thought may be separate you can still think you can sit in a chair sit still and still think but if you get angry your whole body will react if you are happy your whole body will react if facial display your body muscles your movement, your heart rate everything.

That is what the actor has to put into the role so imagine Rasa and that is rasa the Bhav so an actor does something more than the emotion and something more than the cognition he brings cognition and emotion together by studying that there is a certain bodily change this is a certain change of look the facial display the muscular tension everything which actually takes the whole thing to a different dimension we do it also in our life while I am teaching you I am acting like a teacher with my knowledge base and my being is into it so what is difference between acting and all if some actor is showing a certain act on a stage he may be doing lot of body language and all but that is a training to the emotion from cognition.

Because he has decided so say take anger now actor has to show anger and there is a person who is angry in a real situation, showing anger so he will think he will watch how angry people behave train the mind and act angry person will train the mind to say body expressions angry person will have a body expression but he will also have increased heart rate his stress hormone will go up actors are able to avoid.

So this is the difference between acting and showing a our emotion we saw we actually feeling that emotion probably the autonomic response your heart rate, your respiration, you are the stress hormone that is different here it is less here it is very high so showing anger and being angry

becomes too different things if you show anger you can act like this you can train your body muscles to do all that.

But your heart may still not, be very, very normal level a few get angry in the real situation your whole being goes into it and that because that is because here cognition is ruled by emotion in the real situation it is vice versa in acting, I hope you understand you can train your mind to express a certain emotion without the real autonomic expressions of it we saw we in real situation it is the emotion we just come like a burst. Now this whole concept.

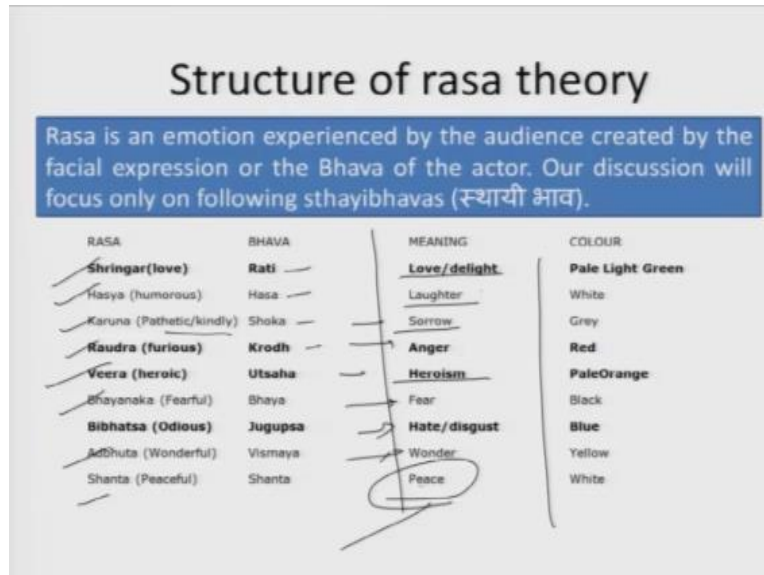
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**Structure of rasa theory**

- The Rasa theory is built around the concept of bhava which is subdivided into vibhava (विभव), sthayibhava (स्थायी भाव), sancaribhava (संकरी भाव), anubhava (अनुभव) and sattvikabhava (सात्विक भाव).
- Bharata enumerates forty-nine bhavas - it is a claim about the range of human experience.

Is used in theatre and acting so this is whatever talking about bhava, Baharat there are 49 bhavas it is a claim over the range of human experience, so when I am talking of range and human experience is not just emotions it is this dimension which emerges from cognition and emotion, why? We will talk in the next lecture.

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So this is the whole list of shringar we all know this shringar are Rasa. Hasya, karuna pathetic and kindly Raudra, veera, bhayanaka, adbhuta, shanta rasa. So what are the essential bhava? Hasa, Shoka, Krodh which is the anger and this is the convergence to our psychological things but this is about love which are higher complex hasa, laughter, sorrow we know this, this is anger heroism this is another higher complex bhava it may not be an emotion.

Fear is a primary emotion this is a primary emotion this is a primary emotion this is another let me call it a cognitive emotion for the example and they went out to the extent of associating color with it but any way you can so this is what brings us to whole blocks of existence it is the interplay between cognition and emotion which actually give you the meaning and the frame of existence so what we will do is I will end up here and may be pick up and try to build up further taking this block an see what does it mean for life, thank you.

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