Digital And The Everyday: From Codes To Cloud
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Lecture - 21
Creating a Machine Zone through Affected Feedback: Leisure and Entertainment on Social Media: Part 02

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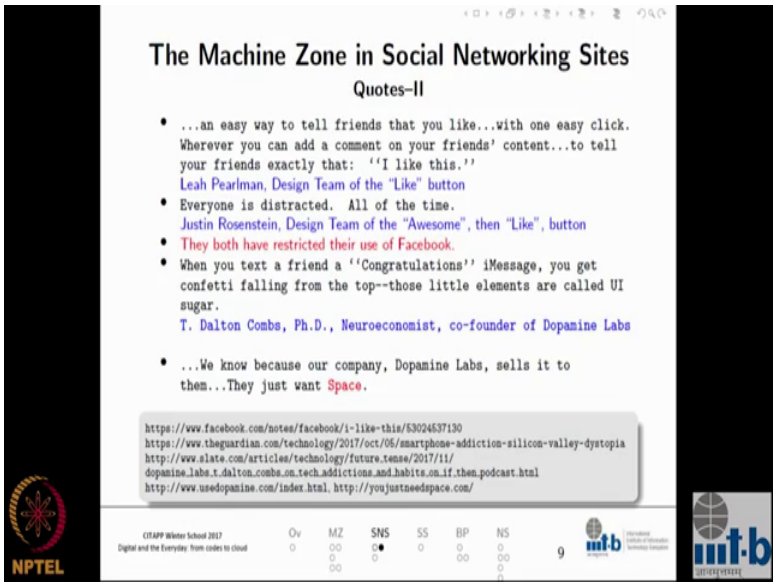

So, again another quote, it says to tell your friends exactly that I like this. So, this was said by this lady here who was on the design team of the like button that you see in Facebook ok. So, this, so these were the, these are the thoughts and the efforts that have gone in into developing this interface that you and I know off today.

So, it is another statement everyone is distracted all of the time; again an associated comment. So, this is by Mister Rosenstein who was in the design team of the like button. So, there is actually a cora post that you can find which traces the history of the development of the like button. So, previously it was thought of being an awesome button and then it moved on took on various guises and now it is called the like button.

These are the guys who have designed it and now they actually have people whom they have hired to make sure that they do not spend too much time on it. Perhaps this speaks something about the drawing power of the social networking sites, ok.

Another one now this is where it gets really scary, but I want you to read this. So, this is ok, let us see if you can take a guess on who could have perhaps done it. So, when you text a friend a congratulations, iMessage you get confetti falling on the top. So, this remember all this is still on your cell phone right this is all virtual we are not talking about real confetti that is falling. This is called UI sugar, user interface sugar ok. These things they are being taken to a whole new level when you are using bakery related metaphors and you know designing technologies on your smartphone apps.

So, this statement was made by Doctor Combs who has a PhD in neuro-economics and he is the founder of a company known as Dopamine labs. If you actually look at this website it is called used dopamine dot com. This is a website of the company that he founded. They actually have a 10 or 15 page pdf document that lists the case studies of companies that have used their application. So, if you actually look at that case studies document that you on their website he gives you a lot of the fancy numbers oh there is like a 50 percent increase in the number of people who spend time on my side, on my app for in different domains healthcare, it could be you know various other things.

So, the repeat customers for this person seem to be in the healthcare domain you know you have apps, that will manage how many steps you have walked in a day or you know whether you have taken your meals on time and what have you eaten this day and so on. So, these this app that was founded by this particular company enables you to the idea is that it enables the user in making sure that these targets are met.

The question is how what is the premise of designing these add on applications, is there a science to it. He also has another company called space, where he provides the solution to make sure that you do not spend too much time on these sites ok. So, he is addressing both sides of the coin. He is giving you a provision where you spend more time on your app he is also giving you a solution that will (Refer Time: 03:25) you away from these things. So, in that technology for you if you will and what people can actually do with it. Yeah, you had a question.

Student: (Refer Time: 03:32) long history and (Refer Time: 03:37) advertising industry (Refer Time: 03:40)

I do not deny that. Say again I do not deny that at all, but what is crucial here is the rate at which we are able to consume it. See your advertisements were you know they run for

30 seconds and you know maybe you do not see it for another hour and now you know that you know if you like let us say you are any of these cable TV channels you know that when you know when an add comes on you can switch to another thing and sometimes these guys even give you a timer at the beginning you know timer at the top that says how many more seconds are left before your next series or whatever you are watching starts.

So, these are queues, these are queues that are provided and you can you can turn them off right, I mean you can switch your channel which is what I am sure you invariably do like in between overs in a cricket match you know that there is going to be an ad, so you will switch to something else. But these technologies that you find on your smart phones do not have any of those things, there is nothing that says stop doing this.

So, I am I seem to be providing a very dystopian view of silicon valley in general you know what social networking sites have actually made people or what state they have got them in, but there are also people who are providing the necessary checks and balances.

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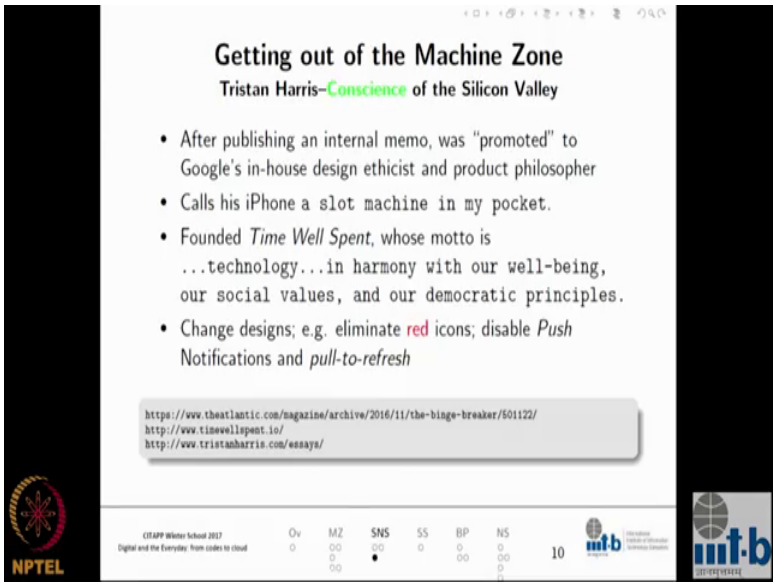

And one of these is Mister Harris he is being termed as the conscience of the silicon valley he was actually with Google a for a long time and he published a memo which basically raise these concerns. His idea was look why is it that we are spending so much time on these on these sites, on these devices and this person actually has some solutions. You can look at his website that I have cited here to see the various solutions that he

offers in order to make sure that the use of these social networking sites does not have to be addictive. He even he even gives guidelines for technologists and user interface designers in how do you ensure that these sites are actually not addictive as they currently are.

So, he calls his iphone a slot machine in my pocket. So, you can see the direct relationship between what the development of gambling machines and what you have these days on your social networking sites. This is the case study bit about I am bringing the relation between an extensive study that was done in the domain of gambling and its analogies and similarities in social networking sites.

Now, let us try to understand why is it that technology has been so successful in actually making sure that this happens. So, from this now we will be ok, before that there is just one slide on the social science aspects of these devices. Some of the theories that have been proposed by social scientists themselves is the transactions between humans and machines that unfold at a greater level of intimacy ok.

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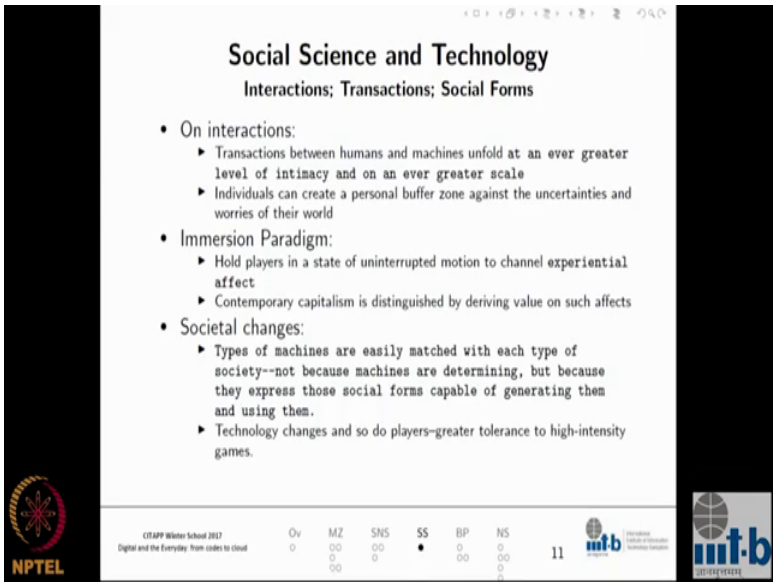

So, this is how technology has the point which technology has come and this enables them to create a personal buffer zone against the uncertainties and worries of the world ok. So, we have seen all those statements that were made by gamblers in the first few slides, people said I want to be in a trance leave me alone I want to get lost in it and so on. So, why is it that from a social science point of view, why is it that what is it that

these technologies are contributing and why are they doing this. Why is it that gamblers or people on social networking sites take to it like fish to water ok. Then again from our socio technical point of view the assemblage as my colleague called it. So, they hold players in a state of uninterrupted motion to a channel experiential effect. So, it is all about your experiences. So, that was an earlier point that I heard is the technology companies want to engineer experiences and this is by effects ok.

So, hence the title of my talk is affected feedback. So, the feedback that you get from these either the gambling machines all your social networking site is affected it is not natural to something that has been developed by through technology ok. So, it is about experiential effect and again if you look at it from a capitalism point of view its again distinguished by deriving value on these effects. Like Google or any of these companies or even Facebook does not charge you to be a part of the of the system right there is no money that is involved, you know you are not paying anything out of your pocket, but they give you experiences. They tell you what your friends are doing, what your family is doing, all the photos that they have uploaded and so on, and out of which they derive monetary value ok.

So, again this again ties in very closely with the privacy issues, what data it is that you are sharing with each of these sites, your notion of identity when you when you share such data whether advertently, inadvertently we do not know. So, seems like these guys have a lot going in for them you know there is a lot at stake. Even though they provide these services for free and that seems to be what, again like people who look at it from our capitalism point of view have their opinions on these on these topics.

So, this is I think something that is again slightly more profound. Just leave it leave it to you to read it, but the only thing that I want to bring your attention to here is they express the social forms that are capable of generating them and using them. So, it is not that somebody is actually enforcing you to use these new technologies, but it is what society wants ok, it is what you and I want which has led to the development.

Now, imagine you are you are travelling somewhere and you have a 2G connection, but you want to check your Facebook I am sure you will be like really irritated because it is so slow your photos are not loading. And look at those even the advertisements that companies seem to be bringing out these days you know you have an elderly couple

maybe as old as my parents who are travelling somewhere and some company says I will give you 4G coverage wherever you are so that you can share all your photos and so on. So, it seems to be a requirement more from our side, from our social side rather than simply a bunch of technologists or mathematicians sitting somewhere and saying look this is what is good for you.

So, it is a colluding, it is an act of collusion both between society which needs these things as well as the people who are actually able to supply them. So, again this is a social science element because you know we are trying to work in an interdisciplinary effort cannot be just people working in silos, what lessons can we learn from these observations in actually the development of systems ok.

So, we will now move on to some hard science, basically from behavioural psychology and bit from neuroscience. So, why is it that these technologies have actually been so successful? This is primarily because of a lot of fundamental research that was done in the topic of behavioural psychology primarily called operant conditioning.

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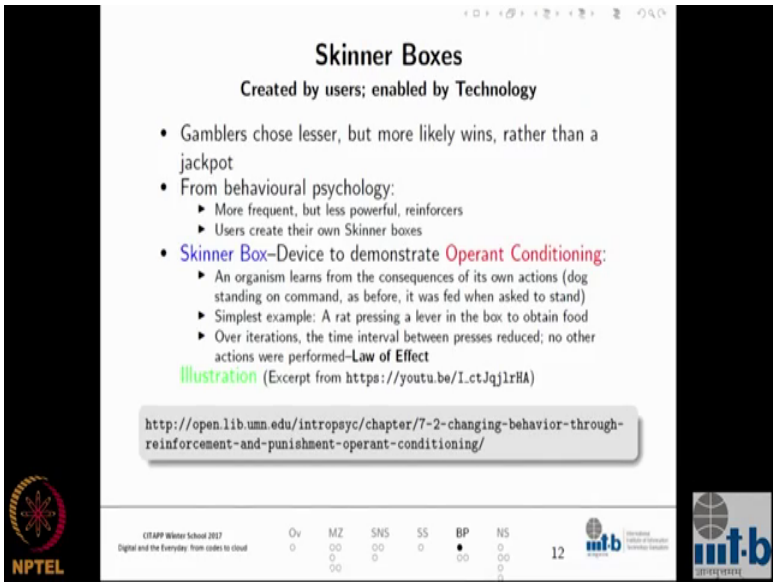

So, in operant conditioning there are several terms that are typically used there is reinforcement there are reinforcers and a system that was actually developed to demonstrate this idea of operant conditioning is the Skinner Box. Skinner was a psychologist who was a on the faculty of Harvard for a very long time and these ideas

were actually demonstrated in about 1920s I have a small video that will kind of explain what these things do.

So, the idea here is that an organism learns from the consequences of it is own actions ok. So, this is the premise of operant conditioning. So, a dog will stand on command if it had been fed before and then asked to stand. So, the queue here, the reinforcer here is the dog is given food and then it has asked to stand and then the next time you ask it to stand the hope is that it will get that same food that it actually enjoyed in the past. So, a rat pressing a lever in the box to obtain food, this is the most primitive example of a skinner box.

And what has been observed here is that each time the rat presses the lever and get some food to eat. All it does after some time is it just keeps pressing the lever continuously. So, the time difference between each press of the lever reduces considerably and at some one of time all it does is just keeps pressing the lever.

So, this has been termed as a law of effect which was actually termed this was proposed much earlier than the skinner this was by another gentleman called Professor Tyndall. So, this was this can be cited here. So, here I have a video, it is about 2 minutes long, but I think you will find it interesting.

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Can pigeons read this one gives every indication because it is been taught to distinguish between two words to behave appropriately.

He is learned his different response to each sign by being rewarded with food. So, the bird is not acting independently, its behaviour is shaped by controlling its environment. The first task was to isolate an individual piece of behaviour and see how that could be changed skinner did this by keeping individual pigeons at about three quarters of their normal weight. So, that the birds were always hungry and food could be used as an automatic reward. The pigeon was studied in a uniform box when it quickly grew used to one piece of behaviour pecking.

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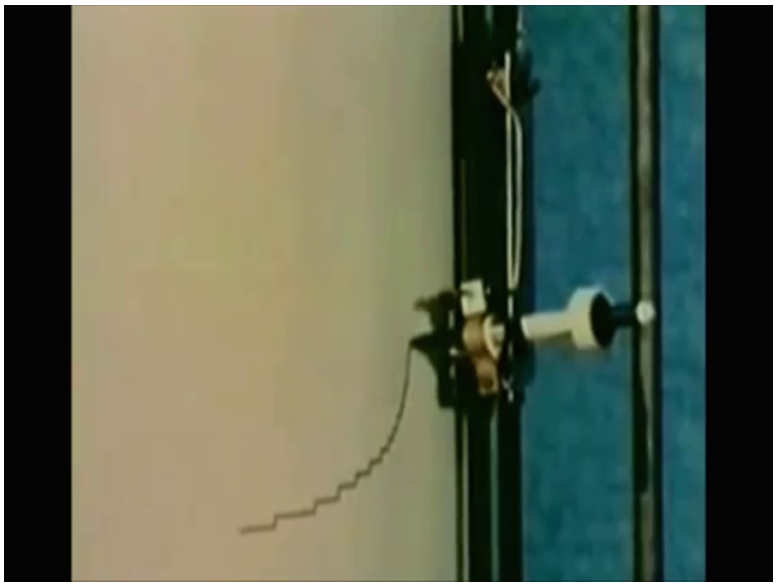

A coloured disc was measured on a graph. The pigeon learned picking the disk produced a reward then the behaviour of pecking could be studied in relation to how often that reward was offered when skinners terms what was the schedule of reinforcement.

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Main thing is what is what we call schedules of reinforcement what the (Refer Time: 13:30) calls reward and you can schedule it. So, that a reward occurs every now and then when a pigeon does something. We usually use a response with the pigeon pecking a little disk spot on the wall and you can reinforce with food, but you do not reinforce every time you are every perhaps every tense time or perhaps only once every minute or something like that there are very large number of schedules and they have their special effects. And there is a good example of how you can move from the pigeon to the human case because one of the one of the schedules is very effective with the rats for pigeons is what we call the variable ratio schedule and what is at the heart of all gambling devices and has the same effect.

The pigeon can become a pathological gambler just as a person can now the fact that we found that out with pigeons and could prove it by removing and changing the schedule makes it easy for us to interpret the case with human subject we do not say that the human subject gambles to punish himself as the audience might say for gambles because it feels excited when he does so, nothing of the sort. People gamble because of the schedule of the reinforcement that follows and this is cool all gambling system they all had variable ratios built into them , but what we have learned from the pigeon it made it possible to interpret this fast field very effectively.

So, you saw that was Professor Skinner himself giving that talk. So, this is actually what I have shown you here is only half of the entire video and I have done that on purpose. So, that moving later, moving in a little ahead you can actually see the other part of the video.

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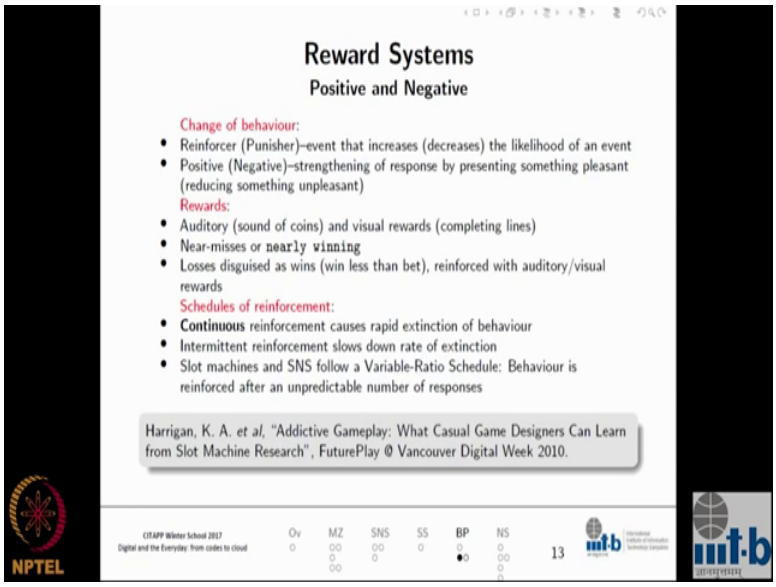

So, what you could see here in the brief interview that you saw the process skinner is the concept of the reward system ok. So, when the pigeon pecked at the red dot you know it would get food. And you also saw the earlier part where you think that the pigeon could read based on whether you showed peck or turn or whatever. So, like this, this is this is what is conditioned behaviour and all this is enabled primarily by rewards which are both positive and negative.

Now, the more, most important thing that bur that was found in these experiments is the question of schedules of reinforcement. So, the idea that was found was if you keep giving a reward continuously after some time nobody is really bothered about it. I mean you know that if you press a lever you will get food. So, you just press a lever only you say when you are hungry and not compulsively ok. So, here we are talking about compulsive behaviour and that is where the variable ratio schedules of actually giving a reward becomes very important. So, slot machines and social networking sites basically follow this variable ratio schedule you do not know what is going to happen next. I mean

that is why we are always in this mad rush to either press the like button or upload a photo or whatever it is. It is not something that happens continuously.

Like even the behaviour is only reinforced after an unpredictable number of responses there is definitely an average. But it is not something that follows a fixed pattern ok. So, what are the sort of rewards that are expected? So, it could be in the form of sound or something that is pleasing to the eye and so on. and in the case of gambling machines the thing that was observed is the concept of a near miss, which I explained to you what it was you saw those reels that were spinning in the video. If you actually read this particular paper they talk about how the technologies that have been used in the development of slot machines can also be used in the play in the design of casual games, you know all your video games multiplayer games that you that you find these days.

So, I think that video was quite self explanatory to give you a behavioural psychology background to why is it that gambling machines and social networking sites have been so successful in keeping us hooked into using them for a long time. So, there are also several addiction theories that have been that have been proposed to explain why can we can we understand and explain these behaviours. So, here are a few of them.

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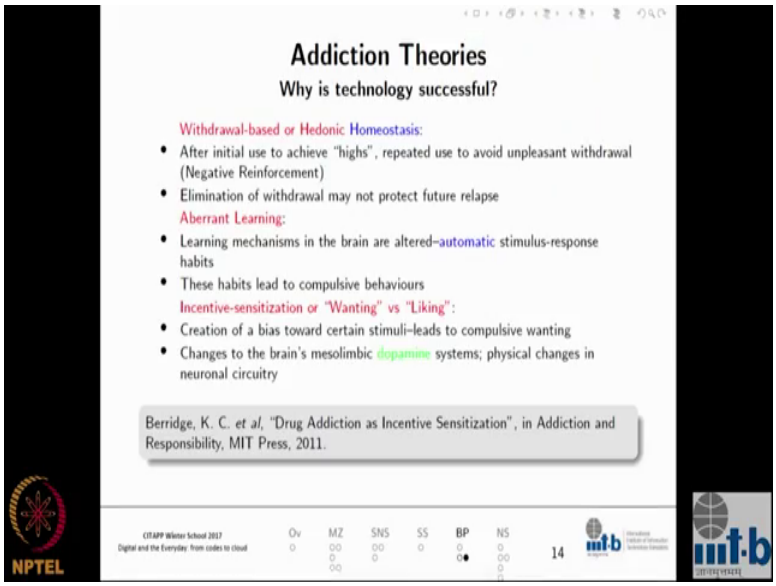

So, the something known as a withdrawal based theory there is aberrant learning and incentive, sensitization. So, withdrawal base basically says that look a person has actually tried this drug or the use of these sites before and now there is a certain amount

of withdrawal and there is a displeasure that is associated when you are in withdrawal ok. And in order to ensure that you do not face that discomfort again you go back to keep on using this ok. So, this is negative reinforcement.

Now, the simplest example that again can give for positive or negative reinforcement is sometimes when I play with my son, when he does a good job you know maybe when he is coloured his drawings very neatly I may say he is very good I may give him a chocolate or something like that that is positive reinforcement. So, next time he is given the same task he would do it well because I know that he knows that you know I want to tell him that he is done a wonderful job. Negative reinforcement on the other hand which is something that people work towards avoiding is say when I talk to him in a very stern voice you know or I scold him because he is done something naughty

Now, he wants to make sure that I do not take that tone of voice again or I do not become very strict with him again. So, that is negative reinforcement. So, people change their behaviours in order to ensure that one of these two things happens, either you want to feel your reward should be positive in nature which makes you feel happy which is why we the which is why the designs of these technologies have been so successful. On the other hand you also have negative reinforcement you want you do not want to feel uncomfortable for a very long time and then you go back and get the same high for a long time.

So, again aberrant learning is again another theory where it says that the actual neural circuits in our brain become altered with repeated use of some maybe a drug. In this case these were these have been proposed in the context of actual chemical drugs, but we can see now a very close look similarity between drugs that were that have been manufactured chemically as well as technologies themselves in giving you the same highs ok.

The other one, I have kept this at the very end because this now gives me a connection to the final part of the lecture which is on the neuroscience background to explaining addiction is the so called insensitive, incentive sensitization theory which says that there are two distinct areas in the brain one is called wanting, the other is liking. And when we have compulsive behaviours or one way to explain addiction is that the wanting part of

the neural circuits in a brain becomes become more stronger. So, you really do not like what you are doing, but you want to do it forever reason.

There are changes that that get affected in the in the neuronal circuitry primarily this has been identified as the as the part of the brain which sees the most change. So, this is the mesolimbic dopamine systems. So, this is now my connection to the neuroscience part of the lecture where we can. So, behavioural psychology again helps us understand why these things happen to some extent I mean, you saw the last line by in the in the talk that we just saw. So, where he says that look I can explain behaviour simply based on changing the schedules of reinforcement can we go a level deeper and try to understand why is it that the human brain actually acts the way it does in acting on these variable reinforcements and what we find is that the culprit to all these issues that we see here is dopamine ok.

So, this is now my connection to the neuroscience part where we try to explain why is it that this happens. So, research has identified that the dopamine which is a tran, neurotransmitter in the brain is connected to the reward system ok.

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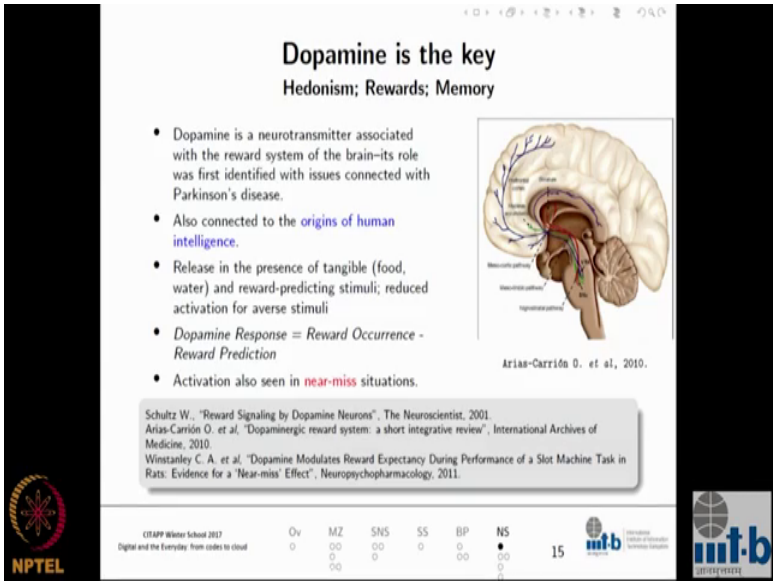

So, this is something that is generated that it is a chemical that is released in the brain and this is what makes you feel happy. So, dopamine and its associated systems in the human brain is what has been identified as the reward systems. This is basically what makes you feel happy, the release of these particular neurotransmitters, and now you can

see the connection between the name of the company that the neuro economists that I had mentioned earlier. His name of his company is actually dopamine labs ok, and dopamine is a neurotransmitter that is a part of the reward system although it forms a very small part of the brain in comparison with the other things. It is what actually drives us to do many things.

And it has been identified that this is also related to so called human intelligence the way you and I know it today. The release of these neurotransmitters evolution has taken take has brought us to the stage where it is the release of these neurotransmitters that has enabled us to come to where we are. You remember that the picture that Professor Manohar had presented earlier about the chimpanzee holding a sharpened stick. So, he said that the monkey actually throws it away after it has used it right, it does not use it anymore after it has eaten its fill.

Have you seen as throwing away any of the tools or the instruments that we have used? No, because we know that if we use them again we will get some reward. And this is where the whole point of memory and learning and all these issues are tied in together along which the dopamine systems, the dopamine reward systems in our human brain which enables us to keep on doing the same thing for a very long time ok.

So, the this particular neurotransmitter is typically released when you have stimuli which could be in the form of very tangible rewards like food or water it is also and other such and other such rewards and then there is a suppressed activation in the case of other stimuli. So, this is you know what we call as negative reinforcement something that you do not want to do something that you do not like in such cases there is not much of an activation of this particular neurotransmitter. This is an equation that has been identified to that has been proposed to explain the release of this particular neurotransmitter there is a reason why I have it, I have this here. So, if you look at the phrases say the responses reward occurrence minus reward prediction ok.

So, I will come into trying to explain the theories that are that have been proposed in the context of prediction in the human brain. So, neuro, the dopamine has been identified to follow some sort of an internal clock ok. So, if at some point of time a stimulus is produced and then there is an associated reward with that say after a certain time duration, that time duration is actually recorded in our brain somehow and the dopamine

is released again when that same stimulus is presented after the same interval of time, the neurotransmitter is released because it knows that this is what is going to happen. You can play how acquit this by changing the schedules. You do not give it at exactly the same amount of time, you delay it, you vary the time when this reward is actually given and this is what affects your dopamine response.

In the case of learning, when the human organism has actually learnt that if I do these things this is the reward that I am going to get over a certain time interval. If the time of occurrence and the time of prediction is the same you can see that the response is basically zero, I am not going to I am not going to feel happy if I know that this is going to be fairly predictable when I get the rewards for this particular and I have predicted that it will happen at this amount of time.

But when you vary the ratio that is when you will see changes in the dopamine response, and this has been investigated experimentally using the using the latest techniques that are available and there are strong results, strong correlations which show that it is these systems that basically have brought us to where we are today and this is what technology has been has been using in order to make sure that you know people spend a lot more time on these devices. So, the activation has also been seen in near miss situations.

So, if I told you that the virtual stops on these gambling machines have were chosen in such a way that you get a near miss feeling, it is like you almost won, but you are not there it there is experimental evidence to show that dopamine as always is released which enables us to you know plan our future actions.

You can find a lot more information in these in these papers; I have selected these particular papers because to some extent they do not get into very very complicated details about the various aspects of human brain. But they give kind of a bird's eye view of the various systems that are that are there, that have been identified in the human brain to explain such activities primarily related to dopamine.