**Human Behaviour**
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**Lecture 08**
**Learning – II**

Welcome friends to this 8th lecture on the course on human behaviour. Now we will start up this lecture by quickly reviewing what we have done in the past 7 lectures. We started off in the first two lecture by introducing the field of human behaviour and the field of psychology, and there we discussed things like why do we know need this course on human behaviour. The answers were probably to study what humans do and how they do, and is required, because humans being like to have much better interaction or much better life than they normally are having.

We then looked at the history of how the course of human behaviour or the study of human behaviour progressed, we started by describing questions from physiology, questions from philosophy which lead to the study of human behaviour, questions like what is the soul, what is the mind, how the soul manifest the mind, what is behaviour and questions like that. Also, whether the mind and soul are they blank at the time when somebody is born or they come with pre-experiences. So, this is the philosophical questions on the physiological side questions like how does the mind do, what it does, how it controls the body and that kind of questions.

So, that was the basic history of how the field started off and from where did it break. Then we looked at the history of the psychology itself, which is the science, which studies human behaviour and we looked at some primitive schools, like structurally school, functionally school. The two early schools and the Gestalt school which is a direct opposition to the structurally school

We also looked at two more school; the behavioural school which is entirely different from what the structural is, behavioural and Gestalt's do, because they say that human behaviour or human actions are kind of a reflex. So, there is no organism or there is no intelligent being in between. And then finally, the idea of psychoanalysis or the psychoanalytic school which believes that most human behaviour comes from hidden desires in the unconscious. We also

looked at certain paradigms and certain a new sciences, which has now come up with psychology like psycholinguistics cognitive neuroscience, behavioural neuroscience and things like that. Towards the end of this lecture we looked at some fields of psychology and we also looked at how to do research in psychology. For example, the methods of experimentation the methods of observation, literature review and all other methods of doing psychology or studying human behaviour.

The next set of lectures were on understanding those receptors or understanding those processes and systems which encode the physical stimulus into the psychological world, and there we looked at two parameters of systems and processes which encode the physical stimulus into the psychological realm. So, two parameters that we focused on was sensitivity and sensory coding. And in sensitivity we looked at two sensitivities, we looked at two basic thresholds or two basic parameters or sensitivity or two basic characteristics of per sensitivity which is defining the absolute and the differential threshold. For that one we looked on something called signal detection theory which describes how human beings make intelligent guesses or human beings detect stimulus in the environment.

Now, the reason for understanding or bringing up the theory of single detection in humans, but not in most other physical devices or physical devices which measure or which encode information or detect information is that human mind or human brain. It has a lot of background noise and this noise is created by those functions which make humans leave. So, all those functions which carry out your everyday day to day activities, the autonomic functions they create a lot of noise, and so human beings have to detect external stimulus or encode external stimulus on the background of these noises and so the theory of single detection comes in.

Now within the theory we have described how the theory really works and what are the parameters of the theory and what are the characteristic of the theory. So, those are the things that we discussed there and for the toe on we looked at those biological process or those biological systems which encode the physical stimulus into the biological stimulus. Towards the end of that lecture we took a model system which is the human eye and explained to you how the human eye a functions and how, whatever we have read or whatever we have discussed in terms of sensations and sensory perceptions, how does they function in relation to the human eye. Then we looked at something called perception.

Now what is perception? When the sensory system encodes information into the psychological realm a meaning has to be generated from that particular stimulus or that particular information, and so perception is basically the way of generating meaning from those stimulus or those information which has been inputted to the sensory systems.

Now, perception as we discussed is a 5 part process starts by putting up attention, which is basically focusing on what information to grab and what information not to grab, and how does this attention work. This was the subject matter of that particular section. Then we looked at something called localisation which is basically locating where the physical stimulus that has been encoded, where it is in the external environment. And this is necessary, because any kind of navigation, any kind of mapping has to be done on locating the external stimulus in the environment.

The third step is basically the recognition process, which basically defines or which defines how humans recognise what they are seeing in the external environment or what has been encoded in through the sensory systems into the human brain. So, recognition is a two part process. There is something called early recognition and there is something called late recognition. In within early recognition it is all about feature detection, the binding problem and that kind of how primitive information is glued together and information is extracted out of it. And within the later recognition, the comparison or the matching data matching goes on.

So, here what happens is, we whatever information comes from the simpler step or from the primary recognition steps, those information or those information bits are then compared across multiple information; multiple information models which have been already stored in the brain and this is called the later recognition process. So, basically it is pattern matching, kind of pattern matching. So, you have a pattern which has been generated from the sensory systems and there are some patterns which are already pre saved in the brain. So, how do you match that is what the later recognition systems is all about. And, so there are several model, we have the simple model and we have the complex model. And so simple model is a one way model and the complex model is a feedback, feed forward kind of a model.

So, that is what we did the in the idea of how recognition happens. Further to that there are two more steps to it; one is the idea of abstraction, how the human brain extracts those information which it is finds necessary from any kind of perception that is, having any kind

of information that it is having and then the idea of constancy which is maintaining certain ratios or maintaining certain constants in terms of the physical stimulus that the human brain is actually seeing. Further to that we ended the section by integrating and showing you how this perception really works

Now, in the last class which was the first section on learning, we looked at what is learning and what is the need of it. And so we describe learning as a relatively permanent change in behaviour which is basically happening through experience. So, parts of it is relatively at permanent. So, it is relative to something and it is relatively permanent in the sense that learning can always go back and relative permanent change in what? Change in the behaviour so, basically it says that the behaviour can always change back and then it happens, how does it happen? It happens through experience in previous memory.

So, a part of learning or more of learning is in terms of memories and past experiences, and a related concept to learning is memory which will see in the upcoming section. Further to that we took to understanding what is learning or what learning is all about and we saw there are two types of learning; we have something called the non-associative form and we have something called the associative form. So, what is the difference? In the non-associative form a single stimulus is what causes learning or the learning is based on the, single stimulus. Two finds exist one is sensitization the other is the habituation and so there is some primary differences with that which we looked in the last lecture.

Since of our interest is more into associative form of learning, we took one of the forms of associative learning. Now associative forms of learning is basically a form of learning where we make associations between multiple stimulus or a stimulus and a response and that leads to betterment of behaviour or change in behaviour. And so in within the associative form, we have three different forms of learning. We have the classical conditioning, we have the instrumental conditioning and then we have the complex learning or basically the observation learning. And so we will start with the brief review what we did in the last class.

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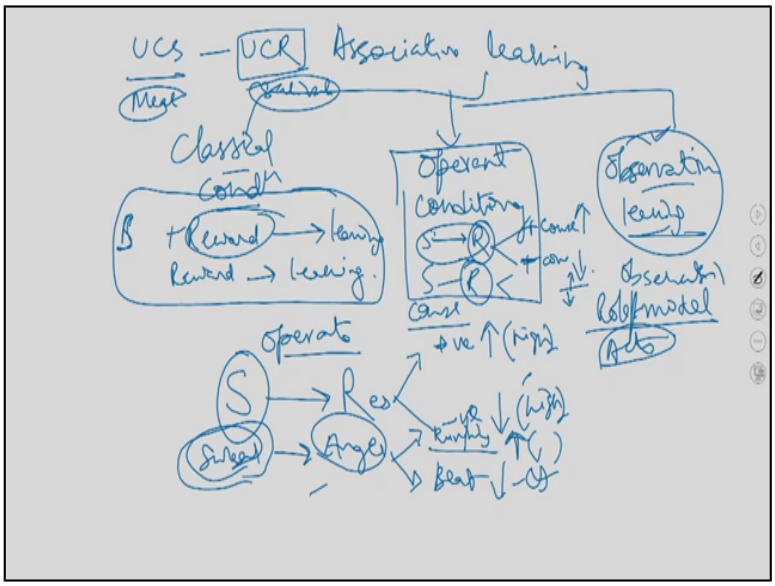


So, associative learning is divided into the classical conditioning, the operant conditioning or sometimes it is called a instrumental conditioning and then we have something called observation learning. So, we did the classical conditioning in the last class. So, we will focus very less into it, what is the primary difference? In classical conditioning, you have a reward which is given up front.

So, reward is given with a particular kind of a; particular kind of a stimuli and due to this what happens is, the learning happens right. So, it is reward contingent which means that reward leads to learning. In instrumental conditioning what really happens is, that the subject it, he does us a response and if this response produces consequences, if the response produces positive consequence the behaviour increases. If the reward produces negative consequence the behaviour decreases. And so in this case the learning is not reward contingent it is response contingent.

So, you do something a particular act, and because of that a certain, either you get rewarded or you get beaten up. And so depending on what kind of consequence you get your behaviour or basically your chances probability or doing that act is defined by your response or the consequence of the response.

In observation learning what happens is, people keep on learning or the learning happens by observing someone, observing a role model. And so observing models or I would say

observing role models and we look at all the acts that the role model is doing and if the acts are rewarding, the acts of the role model are rewarding, we actually learn it, if the acts are non-rewarding those acts we do not learn. And so, since we have already done classical conditioning let us start by investigating what is operant condition.

And as I said in operant conditioning what happens is, you operate on certain behaviours. So, if there is a stimulus and this stimulus leads to a particular response, this response may have multiple consequences. If you have a positive consequences the chance of you doing this act repeating that act increases and this is lead to high behaviour or high probability of repeating that act, if the consequence. So, this is my response and this is my consequence. If the consequences negative the chances are that the reputation of these behaviour will be very less in future. And so let us take an example.

So, let us say that you show anger that you, if somebody say something bad to you, you show anger. Now a bad word, a swear word is said to you and because of that you respond by anger. If this anger leads to the other person running away this is a positive response right. And so you, in all cases where people tell you swear word you will be angry, but in another words if you show anger to a swear word, if somebody says you a swear word and what happens out as a result of it, people do not run away, but they beat you up, then the chances of showing anger as a response to swear word will decrease and this is as simple as you can get to what is operant conditioning.

Now, operant conditioning is more better conditioning, the reason being that classical conditioning only works with natural stimulus. Now you have to remember that in classical conditioning what we saw is, that there is something called the uncondition stimulus and the uncondition response. So, the uncondition response which is the salivation that we were getting has to be already get linked with the meat powder. If the meat powder does not produce salivation on its own to start with, we cannot pair a tone to the meat powder and then get the tone to produce the salivation, but if you want someone to learn a novel behaviour.

For example, if I want my dog to respond to salivation through a tone I can use classical conditioning, because it is reward contingent, but suppose I want the dog to do something extra, I want the dog to actually roll on the floor or get me my paper. Now if that as the question which I want the dog is not going to learn by classical conditioning. So, what I do is,

instrumental conditioning, I will reward the dog if he brings the paper to me or if he approaches towards the paper or anyone anywhere near the paper or fiddles with the paper so I will keep on rewarding.

So, the dog now understands that, if instead of wondering around if he grabs the paper in his mouth and he brings it to me or if he supposedly grabs the paper, newspaper or letter or any matter of fact of that behaviour which we have a training, if he does something like that then he gets a reward. So, he does that particular act again and again and. So, if we want someone to learn a unusual behaviour, to learn a behaviour which he is not linked to which he has not been doing previously, the conditioning or the learning that you have to use is something called instrumental conditioning.

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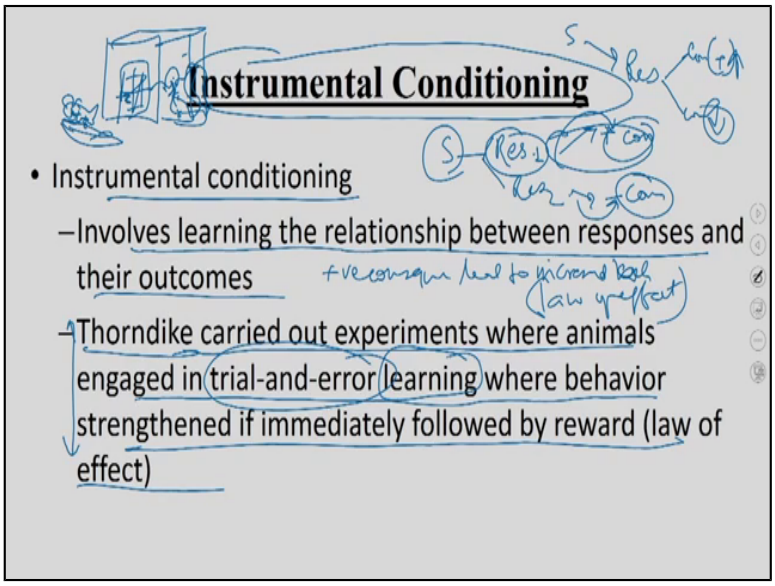


So, let us start with what is instrumental conditioning, the definition of it. Now what is instrumental conditioning? If we look into it, instrumental conditioning has been defined as that it involves learning the relationship between responses and outcome. So, basically if there is a stimulus and this stimulus produces responses, let us say a stimulus produce two response; response 1 and response 2. Now response 1 leads to positive consequence and response 2 leads to negative consequences; what will happen? People will actually do response 1 and not do response 2.

The reason being that instrumental conditioning is learning what response leads to what consequence. Now also it may so happen that you, if you have stimulus and the stimulus response, the response to the stimulus might give two consequences; a positive consequence and negative consequences. Now on cases when it is giving positive consequences people tend to do this act again and again, but if it is giving a negative consequence or a negative feedback out of it people will not do this consequence, this act. Now this particular theory or this particular idea that positive consequences lead to increase behaviour is what is called the law of effect.

The law of effect was proposed by Thorndike E L Thorndike and what E L Thorndike actually said is that those acts which are lead by a positive consequences. People associate these positive consequences to the response that they are giving and that increases the likelihood of doing that behaviour again and again. But if a thought or if a particular act leads to negative consequences people relate this with a idea that not doing this behaviour or avoiding this behaviour and so that is what the law of effective, law of effect is all about.

Now, Thorndike carried out experimentation where animals engaged in trial and error learning, where by behaviour strengthened if immediately followed by reward or law of effect. And so what was the original experiment of Thorndike? In Thorndike's original experiments, what he did was he took a cat and let me see if I have Thorndike's experiments. So, what Thorndike did was, he took a cat and put the cat in a simple maze. So, I have a maze like this right, and this has a door a latch. So, what Thorndike did was put a cat in this. This is my cat of course, you have to bear with me in terms of the drawing and so, this is a latch, this is what the door is and out just outside the cage is fish right, some live fish here of course, funny, but you have to bear with me.

So, here is my cat and what Thorndike actually did was, took this cat and put into this particular kind of a enclosure and put the latch onto this thing. Now when the cat was put in and there was fish outside the first act that the cat did was raised it elbow and raise it paws and try to get the fish, but it when its did not get the fish, it started going all around the cage and doing all kinds of behaviour. Now what happens is, one of the times she actually hit the latch and the latch opened the cat could come out and eat the fish, as soon as that happened, Thorndike again took this cat inside this particular cage and the cat again did some of the behaviour.

And so in multiple versions of it what happened is, cat actually did most of the behaviours that was happening, but as time progressed what Thorndike saw is, that many of the (Refer Time: 20:51) behaviours the cat stop doing and there was a time when as soon as the cat was put into the cage, it actually opened the latch and started eating the fish and that is what is the law of it.

The cat realised that doing all these unnecessary behaviour it learned by something called trial and error. So, what it learned is that, it doing unnecessary behaviour is not going to reward it. So, it learned the behaviour that what I have to do is, open this particular latch and if I open this latch the door is going to open and I can get the fish. And so, what Thorndike said is, that is what is basically the idea of trial and error and this is how people learn or in this case the cat learn about the fact that it is going to get the food.

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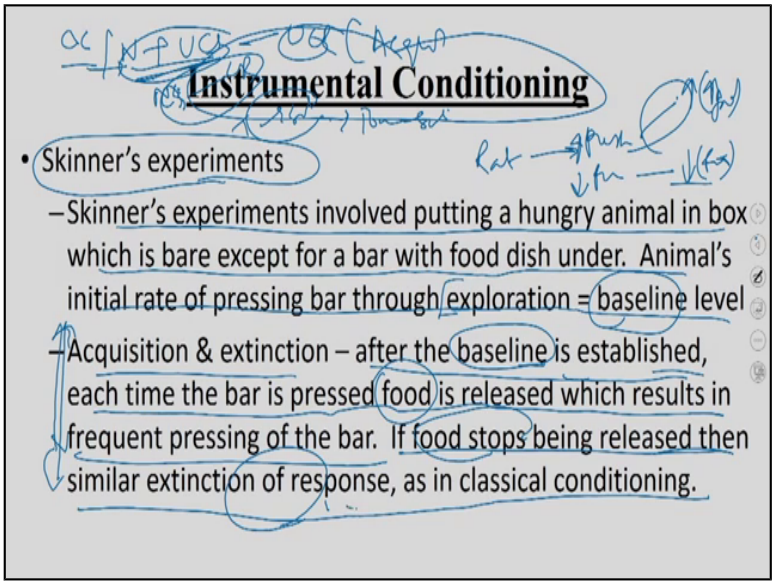


Now, another kind of experiment that was done on instrumental conditioning was done by someone called B F Skinner. So, Skinner's experiment was more simpler than what Thorndike did. And so what was the experiment. Now Skinners experiment involves putting a hungry animal in a box which is bare except for a bar with food dish under. Now animal's initial rate of pressing bar through exploration is the base line level.

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And so what Thorndike actually did was, he designed a more simpler experiment. In this experiment as you can see this is a rat right. And so the rat has been put in this particular kind of a box. Now this box has one lever and as you can see the lever is here somewhere, this is where the lever is and what the cat, the mouse has to do, the mice has to do is press this lever, now initially and this lever is attached to a food pipes. As you can see this is food grain and this is a food pipe and this is an electronic system which tells how to deliver the food, and.

So, what the rat actually does is, the, and this cage is empty there is nothing here except one lever which is there, what the rat actually does is, initially the rat does not do anything. So, it keeps on doing a lot of things. And so it in one of those times it presses this lever, when it presses this lever it gets the food. So, what the cat real, what the rat realises is pushing this lever actually increase the delivers the food, and so when he realize that he started pushing the lever more and more and started getting more food or food at a very higher ray.

So, initially how this experiment was done? Initially there was no food given to the rat and so it, the a base line was established, it was seen that how many times the rat actually press the lever and that was called the base line of pressing or the base line level of pressing after that what happened is, the rat was then a paradigm was formed in which the food was released. And so the more number of times or the more harder, more number of presses that the rat was doing the more number of food, it was getting and that was the experiment which Skinner has

designed for itself and its a more simpler experiment to understand how this instrumental actually, instrumental learning actually works or instrumental conditioning actually works.

And so what is happening here as the rat pushes the lever, the where is consequence the more you push, the more the higher push you do the consequence is high food. And so what the rat is the over pushed, you push you will get less food. So, what the rat started doing is, pressing it higher and higher and getting the food

Now, acquisition and extinction: now similar to the acquisition and extinction that we are seen in classical conditioning, acquisition and extinction also happens in instrumental conditioning; what is it? Now how do the rat acquire something and how does the ex extinction happen. So, after the base line is established each time the rat, the bar is pressed, food is released which results in frequent pressing of the bar. Now this is the acquisition part of instrumental conditioning. Remember acquisition in classical conditioning, how does it really work, what happens in classical conditioning is the more number of pairings that you do, the more frequent pairings that you do of the neutral stimulus and the uncondition stimulus.

So, in terms of classical conditioning the neutral stimulus plus the uncondition stimulus.The more number of pairings that you do, the more is the uncodition response and better is the learning and this is these trials in which the neutral stimulus is paired with uncondition stimulus is called the acquisition stage. In instrumental conditioning after establishing a base line, because you do not know how many presses or how much the rat was already pressing. And so or how many times the rat is going to press the lever. So, it was established something called the baseline and baseline is the value or baseline is the number of presses the rat is doing of the lever, irrespective of it is given a food or not. Once the baseline is established the food is started being released each time the lever is being pressed.

Now, if food stops being released then similar extinction of response as in classical conditioning happens. So, both acquisition and extinction, in extinction; do you remember what is extinction in classical conditioning? So, what happens is, at a point of time what happens is, when the neutral stimulus is given which now becomes the classic, the condition stimulus starts giving the condition response. So, the tone produces the salivation, but sooner or later the dog realizes that it is the tone which is making him salivate and he stops and this

is what is called extinction. In terms of my instrumental conditioning also there will be a point when the rat will not get any food by pressing the lever.

And so if the food stops being released, then the rat will not press the lever anymore and this is what is extinction. As you can see here, this is where my rat is, this is where my food particles is and the person who is sitting here and designing something on the computer is how many trails will I actually give the food and this is very funny because it tells, will press lever for food. So, this is the rat who goes into this box and presses the lever for food interesting.

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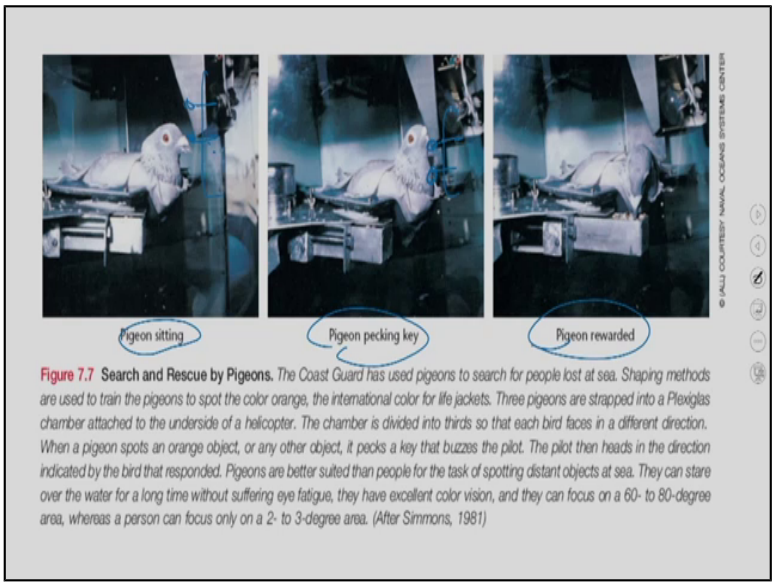


Figure 7.7 **Search and Rescue by Pigeons.** *The Coast Guard has used pigeons to search for people lost at sea. Shaping methods are used to train the pigeons to spot the color orange, the international color for life jackets. Three pigeons are strapped into a Plexiglas chamber attached to the underside of a helicopter. The chamber is divided into thirds so that each bird faces in a different direction. When a pigeon spots an orange object, or any other object, it pecks a key that buzzes the pilot. The pilot then heads in the direction indicated by the bird that responded. Pigeons are better suited than people for the task of spotting distant objects at sea. They can stare over the water for a long time without suffering eye fatigue, they have excellent color vision, and they can focus on a 60- to 80-degree area, whereas a person can focus only on a 2- to 3-degree area. (After Simmons, 1981)*

Another experiment that B F Skinner did was, it pigeons in zoo what he did was, he was teaching something called avoidance learning and its its a little bit higher than instrumental conditioning, because what is being taught to this pigeon, is to respond to green light and not respond to red light, and so the basic response to the pigeon is that it pecks. So, what Skinner did was, he created the pecking system like this. And so there are two lights here; a green light and a red light and when the green light comes in, food comes in, but is the red light is flashed food does not come in. And so what the pigeon learned is, to respond to the green line and not to the respond to the red light and that is what is there. So, pigeons sitting, pigeon pecking key, pigeon being rewarded that is what it is. We will see the food.

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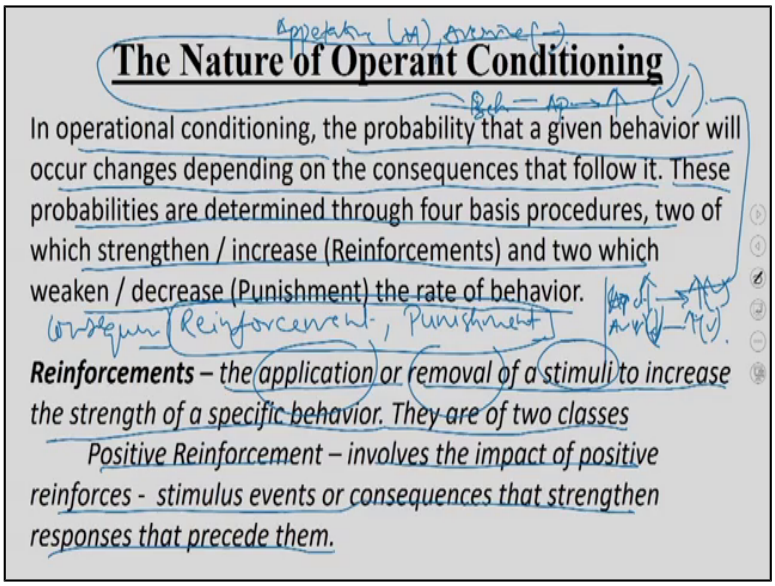


And so this particular experiment was to find find out whether people can discriminate between or pigeons can discriminate between two different versions of the same stimulus, which has been given to it, or two versions or the response, two versions of the stimuli which has been given to it. So, can it discriminate that and can it also study the consequence, because the consequence will tell if the behaviour will increase or not.

Now, what is the nature of operant conditioning? Let us have a look at that. Now in operational conditioning or operant conditioning the probability that a given behaviour will occur changes, depending on the consequence that follows it. As I have said again and again what happens in operant conditioning is, that you do a particular act, you do a particular behaviour to a particular stimulus. Let us say that somebody hits you, you become angry, this is the response.

Now if the anger is rewarded in some way the consequence, what is the consequence of anger? They can be two consequences, if you by being angry you make the other person who has said bad words to you, run away, this is the positive consequence, but in other case if you become angry, the other person also becomes angry and the feud comes in or you get beaten up by the other person then it is a negative consequence.

Now if it rewarded in senses the person who says bad words, actually moves away or runs away then the positive consequences there in. So, you will do this behaviour being angry you

in on when somebody says a swear word that will repeated again and again, when the other case is the other way round. If you see that somebody says swear word to you and he beats you also then you are not going to be angry anymore, that is what it, it is all about.

Now these probabilities are determined through four basic procedures; two which strengthen or increased reinforcement and two which weaken or decrease which is the punishment. So, there are two terms to be noted; one is called reinforcement and the other is called. So, the consequences that I have can lead to reinforcements or punishment right. The consequences that happens in class in instrumental conditioning can lead to a reinforcement or a punishment.

Now, what is reinforcement? There are two types of reinforcements. So, we will see this reinforce and reinforcement is a consequence of a particular behaviour. And so what is reinforcement? The application or removal of a stimulus to increase the strength of a specific behaviour, they are of two classes. Now if you do a particular act and because of that or if you get a particular kind of a consequence, and because of that consequence you increase the probability of doing that behaviour again and again, this is called positive reinforcement right. So, what happens is, if by doing a particular act and aversive an appetitive stimuli, if by the inclusion of a appetitive stimuli, if I now appetitive is basically, first let me define what is appetitive.

There are two types of stimuli; one is appetitive which is the positive stimuli or liking stimuli and the other is called the aversive stimuli, which is the one, which is a negative one. Now if an appetitive stimuli. So, let us say this is your behaviour, if this behaviour leads to an appetitive stimuli, because of which a behaviour increases, you say that this is positive reinforcement right. So, basically how it is? The consequence if an appetitive stimuli leads to an increase in behaviour this is called positive, a positive reinforcement and if the removal of an aversive stimuli, if appetitive stimuli is included behaviour increases, this is positive reinforcement. If an aversive stimuli is removed and that leads to increase in behaviour this is called negative reinforcement.

Now, let me first explain to you what it is. It is very easy to understand if by including or removing a stimuli a behaviour increases or the chance in a behaviour increases; that is called reinforcements. Now there are two class of reinforcements we will look at punishments also

and I also give you a lot of examples of how these are, what is positive reinforcement, it involves the impact of positive reinforces, stimuli events or consequences that strengthen responses, that precedes them. Let us say that you do something good, you get very good in exam, good marks in exam and because of getting this good marks you actually get a bicycle from your parents.

Now the chances are, what is the chance? The chances are that always you will do good in exam, because you never did this act of getting good marks because of the bicycle, because it was not promised at all. And so what happens is that you actually did good in exam on your own and that was followed by a positive consequences and the positive consequences is the act of getting a bicycle or getting a reward, any reward it could be. And because of that you are happy now, and so you will do good in exam, because now what has happened is, doing good in exam actually gives you a reward.

So, what happens here is that the initial behaviour which is doing good in exam was not rewarded at all. Had it been rewarded it would be classical conditioning, but the very act of getting good marks led to a particular positive act, a particular positive reward that you get and this is called positive reinforcement, but let us say that you want to study, right or you have friends who are intolerable in your hostel room, who are sitting. Now one way to understands is positive reinforcement.

So, what you will do is, since you do not want to get into any kind of trouble, you will avoid going to your room when your friends are present, who are very abusive. And so here what happens is an aversive stimulus and by removing a stimulus what happens is, you are feeling positive or you are rewarded.

So, by not going into your room you are rewarded, because you do not face that situation where you have to fight or tolerate these friends of your who are very unlikable. So, friends of yours who are sitting in your room and very intolerable and you do not want to meet them. What you do is you avoid the room altogether, do not go to the room and that leads to positive consequences, because then you do not do not have to fight with these people or say anything to it, these people, and so this leads to positive behaviour, because each time you see these friends together you will avoid them and by avoiding them you feel happy and so this is called negative reinforcements.

Now, negative reinforcement in situation in which a stimulus is taken away and aversive stimulus is removed, something that you do not like is removed and because of that what happens is, you feel good and so you do this behaviour again and again right. So, something that is to be avoided.

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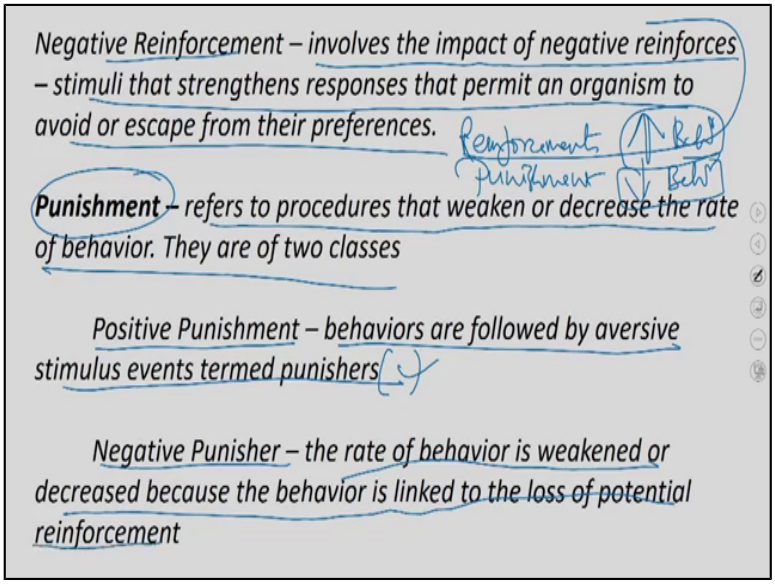


So, negative reinforcement as I have already explained involves the impact of negative reinforces, stimuli that strengthens responses, that permit an organism to avoid or escape from their presence. So, in one case if you do good in an exam and because of that you get a reward, you do that behaviour again and again, this is called positive reinforcement. In the other case you avoid your friends, because they are not good and by avoiding you feel better, or if you feel happy. So, that is also a kind of reinforcement or kind of reward, but this is called negative reinforcement.

Similarly there is a concept of punishment, what is punishment? It refers to the procedure that weakens or decreases that rate of a behaviour. Now there are two classes, remember that reinforcements increases behaviour, whereas, punishment they decrease behaviour that is a primary difference right, that has to be understood. See punishment, if you give punishment a particular behaviour will decrease, but if you give reinforcement a particular behaviour is going to increase and that is the difference between the two and within the increase of behaviour, there are two kinds; one is called the positive reinforcement the other is called the negative reinforcement.

Similarly we have punishment, and so as I said punishment is something applying a stimulus; so, applying an aversive stimulus. So, if you give an a aversive stimulus and because of the aversive stimulus a behaviour decreases, this is called positive punishment or in other case if you take away an appetitive stimulus, if you take away something that the person wants and because of that a particular behaviour decreases; that is called negative punishment

So, let us understand what they are, it refers to the procedure that weakens or decreases the rate of behaviour. They are of two classes; positive punishment behaviours are followed by aversive stimulus events that terminates that is termed as punishers. For example, let us say that you are two brothers and so you fight among themselves or you fight among yourself. And so you hit your smaller brother, he cries and because of that you get a good beating from your parent. Now this behaviour of hitting the brother which leads to punishment, which leads to hitting by the parent is a punishment and so, you will not this, do this behaviour again and again, hitting a sibling and that is called the positive punishment. But there there is something called negative punishment also.

So, what has happened? Here is a negative stimulus and aversive stimulus inclusion, if an aversive stimulus beating leads to decrease. So, beating you by the parent is the negative stimulus which has been included in the whole paradigm and that leads to the decrease behaviour of not hitting the sibling which you have done. Now negative punishment is a situation in which a positive stimulus is taken away from you and because of that your behaviour that you due to a particular stimulus will also decrease.

Now, the rate of behaviour is weakened or decreased, because the behaviour is linked to the loss of a potential reinforcement. What happens here is that let us say that you are driving on the road right and you do not have a helmet. Now one way is to fine you there and for the helmet, but a better way to teach you is using negative reinforcement, it is also called omission training. Something that you like is taken away from you. So, while you are not wearing a helmet, let say the police [FL] takes away your license or it takes away your vehicle only.

Now the vehicle is something that you like and or the license is something that you like, and it took away the license instead of fining you for the particular crime that you did, which was not wearing a helmet and so taking away something that you like and by that punishing or

decreasing your behaviour. So, you realise that each time you do not wear a helmet, the license will be taken away. And so now, you start wearing the helmet. So, taking away something you like and punishing you in that way to decrease behaviour is what is called negative punishment.

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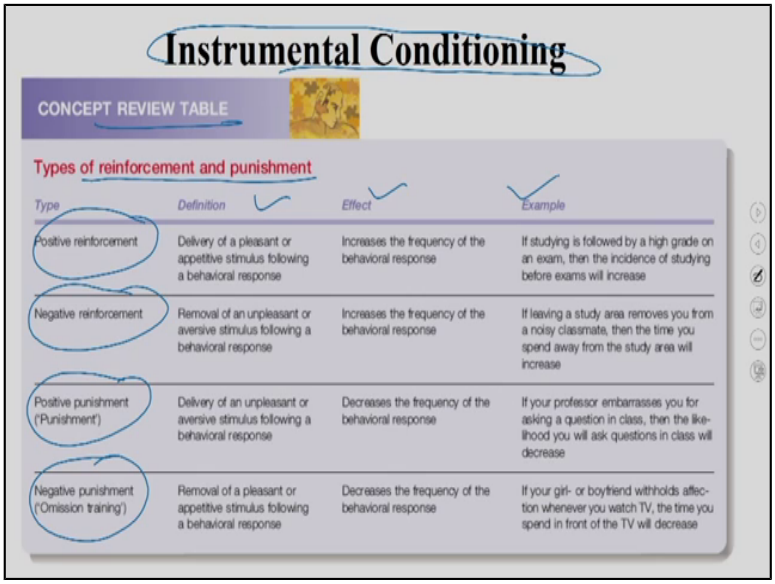


Now, let us look quickly, look at some instrumental conditioning and the concept review table types of reinforcement and punishment. So, this is what my positive reinforcement look like. This is what my negative reinforcements look like, this is what my positive punishment look like and this is what my negative punishment looks like. There is a definition, there is an effect and there is an example.

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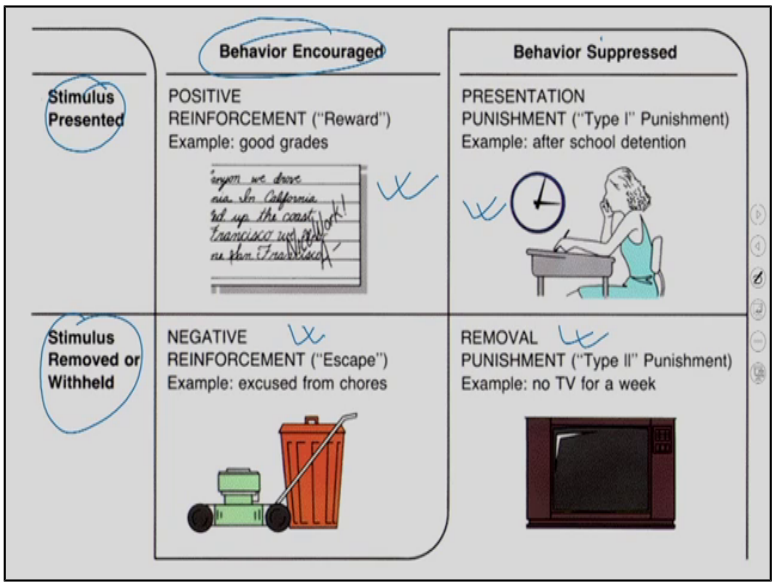


Quickly shift to the next one here, the behaviour as you see, can be encouraged. Here the behaviour is suppressed if you look here, this is where the stimulus is present, this is where the stimulus is removed. So, four different consequences; you have positive reinforcement here, you have the presentation punishment, positive punishment, negative reinforcement and negative punishment. Four different types and four different examples.

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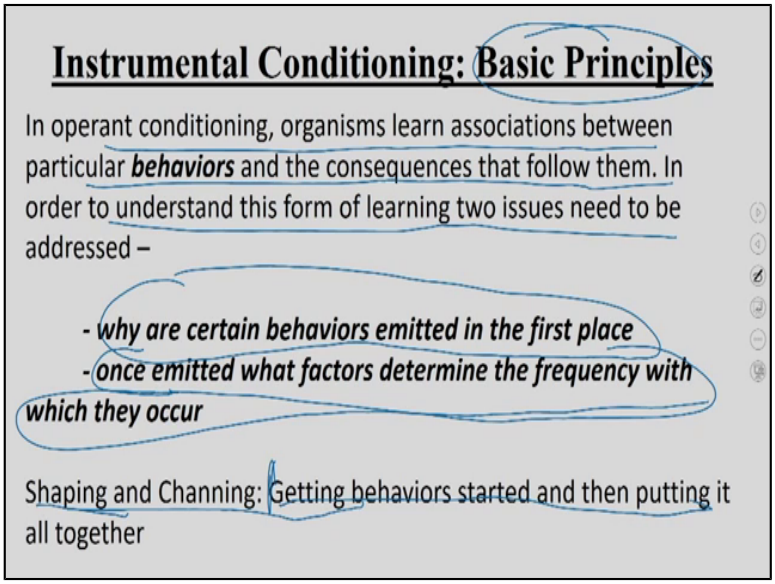


Now, instrumental conditioning; the basic principles of instrumental conditioning. Now in operant conditioning organism learn associations between particular behaviours and the

consequences that will follow them. Now in order to understand this form of learning, two issues need to be addressed. First why are certain behaviours emitted in the first place and the second is once emitted what factors determine the frequency, with which this will be emitted two things have to be understood, in understanding the basic principles. Now there are some related features with instrumental conditioning is the idea of shaping and chaining, and what is shaping and chaining? The shaping is getting behaviour started and then putting it all together right.

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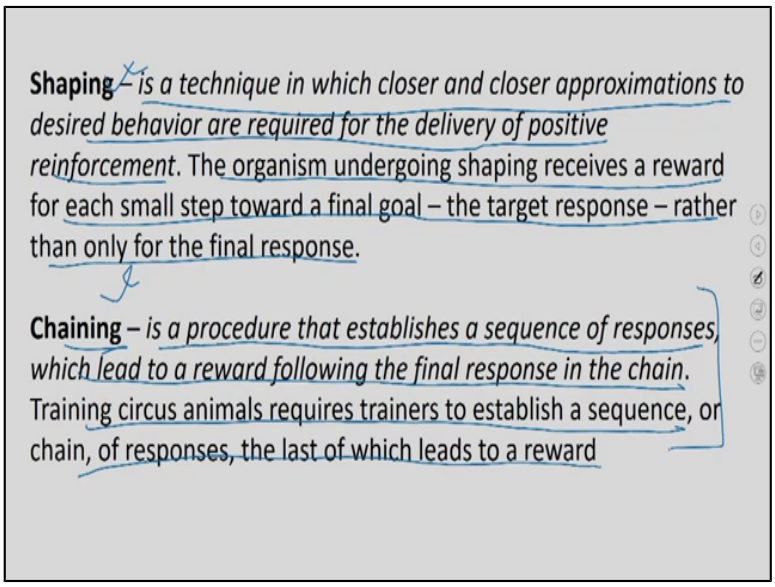


So, what is shaping? First of all let us see and then I will give an example. So, shaping is a technique in which closer and closer approximation to a desired behaviours are required for the delivery of positive reinforcement. The organism undergoing shaping receives a reward for every small step towards a final goal, the target response rather than only for the final response. And quickly related to this, or very much related to this is the idea of chaining, which is a procedure that establishes a sequence of responses, which lead to a reward, following the final response in the chain. Training circus animals requires trainers to establish a sequence of chain of responses the last one leads to the final reward.

Let us say that I am training an elephant, or I want to train an elephant to ride a bicycle, how do I do that. Now elephants do not ride bicycle and so, the only way to do that is, first using shaping. So, I will give rewards to the elephant as soon as it reaches near the bicycle, it holds the bicycle and so on so forth. And chaining is basically dividing the whole behaviour, right

from where the point where the elephant gets interested in the bicycle to the point that it actually rides it. So, I will break the whole behaviour into smaller parts. The reward is given to when it approaches near the bicycle or when it does something, then it approaches the bicycle, then it touches it, then it sits on it, then it rides it and so on and so forth. So, these behaviour is broken now into several behaviours, and then all of them are chained together in a sequence or mixed together in a sequence, so that finally, from the point of time that the elephant was not interested in the bicycle to the point of time there elephant is actually riding a bicycle.

Now by giving smaller rewards or rewards on each step of the way, I can make the elephant ride a bicycle. Always remember classical conditioning happens with natural stimulus, instrumental conditioning can happen with all kind of stimulus. And so this is the pattern in which it actually works.

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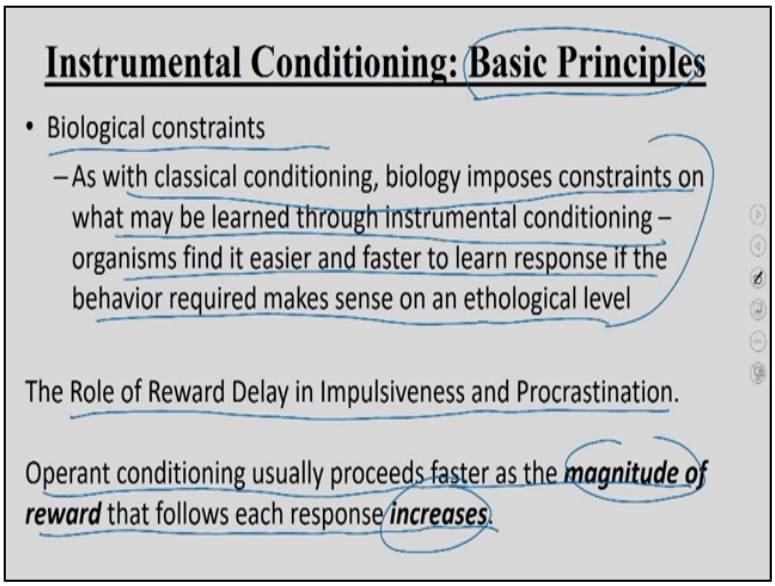


Now, there are certain biological constraints also to instrumental conditioning. Now as with classical conditioning, biology imposes certain constraints on what may be learned through instrumental conditioning. Organisms find it easier and faster to learn responses, if the behaviour required to make sense at the ethological level. For example, there are certain behaviours that certain animals do not do or certain animals do. For example, rats are very good at digging. So, if you want to teach it a behaviour which is related to digging, it will always like it, but rats certainly do not like certain other kind of thing for example, playing a

flute, or doing complex task and if you want a rat to do that what it will do is, it will not like that or learn that behaviour, or for that matter rats like digging.

So, what happens is if you give a rat some money or if you give a rat a counting task to do on a floor, what it will do is it will take the money and borrow it or burry it under the, what do you say under the sand. Now the proper behaviour or the original behaviour the rat is burying things. And so if you give it something it will actually burrow it right, it will not play with it, it will not demonstrate it, it will not learn anything from it. And so that is the biological constraint. Or in the case of elephants, elephants are not made to, or bears are not made to ride a bicycle.

So, sometimes what will happen if they feel very awkward, or if they are not feeling good they will take the bicycle and start hitting you with a bicycle, because the original response of the elephant is not riding the bicycle, but throwing the bicycle around with it tusk. And so, if it realises it or something goes wrong, it will start hitting you with the bicycle and that is the natural response, those are the biological constraints.

Now, the role of reward delay in impulsiveness and procrastination; that is another thing to be read or the basic principle of instrumental conditioning. Now operant conditioning usually proceeds faster as the magnitude of reward that follows each response increases. Now more number of rewards you give to people with each response, the higher the, the more reward that you get, the higher the behaviour or higher the consequence of that behaviour will increase.

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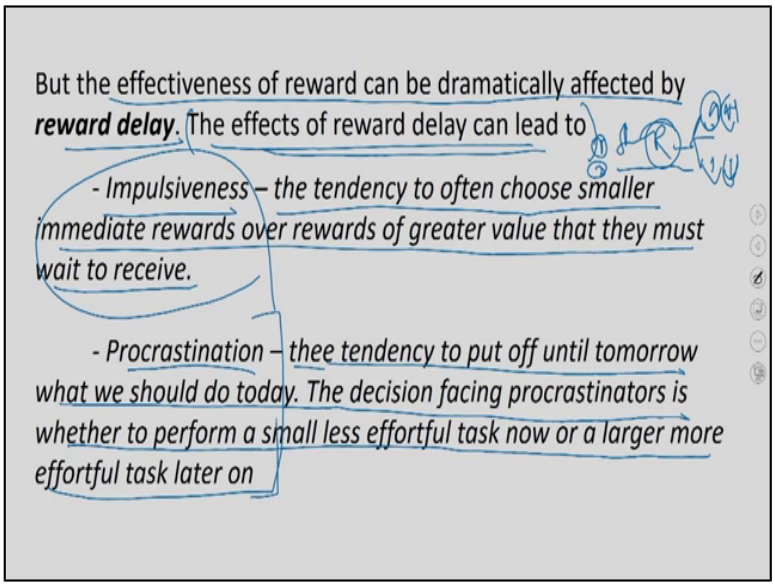


Now, but the effectiveness of reward can be dramatically affected by delay reward, how much time you are taking in between given reward. As I said stimulus leads to response which leads to consequence, which is reward then behaviour increases and if it is a punishment behaviour decreases. Now how long do you take to give rewards, that is also another effect which is there. Now two factors to be the effect of reward delay can lead to. If the rewards are delayed, if the rewards are not given, so if this is one trial multiple trials are there.

If the rewards are not given or if the reward that you get, or out of doing a particular response if it is delayed by sometime two factors can happen; impulsiveness, the tendency to often choose smaller immediate rewards over rewards of greater value that they must wait for, is called impulsiveness.

So, what happens is if the reward delays too much what will happen is, the subjects or the person who is learning, he will choose smaller rewards and rather than the larger reward. Also something called procrastination if the reward delay is longer the procrastination also can happen. So, the tendency to put off until tomorrow, what we should do today, the decision of facing procrastination is whether to perform a small or less effortful task now or a larger more effortful task later on. And so, what happen if the reward is not given enough, a reward delay is there people may also turn out to procrastination, saying that I will not do it today, I will do it tomorrow and so on and so forth and that kind of delay they can do.

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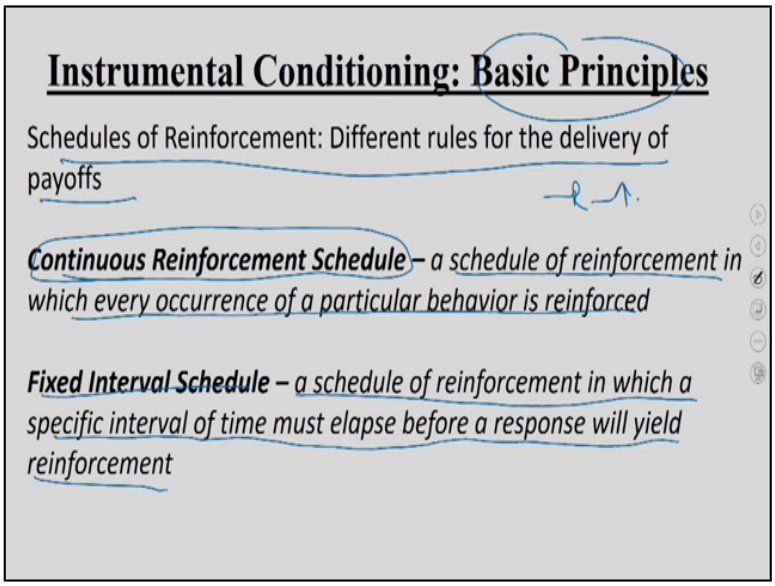


Instrumental conditioning basic principles; so, there is something called schedules of reinforcement or different rules or delivery of payoffs. So, how do we give the reward, or what is the way of giving the reward? One of the ways of giving the reward is called the continuous reinforcement schedule in what happens is, the reward is given for each kind of behaviour. So, a schedule of reinforcement where every occurrence of a particular behaviour is rewarded.

So, every response that you get you get a reward. Fixed interval schedule, a schedule in which reinforcement, who was specific interval of time much elapse before a response will yield. And so here what happens is, the specific time elapses and after that particular time a reward is given to you, like you get a salary.

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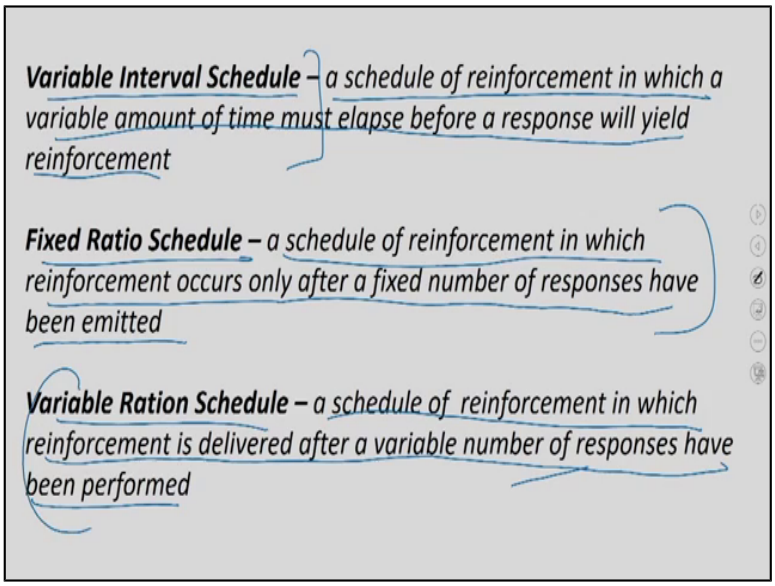


So, after thirty days you get the salary. Variable interval schedule, a schedule of reinforcement in which a variable amount of time must elapse before a response will be given to you or a reward will be given to you. For example, in this case you can have bonuses and all. Now, fixed ready ratio schedule; a schedule of reinforcement or schedule of reward in which reinforcement occurs only after a fixed number of responses have to be emitted.

Here there are things like when you work in a company then you have to do a fixed amount of job, only then you will get the reinforcement and so that is the example. And variable ratio schedule, a schedule of reinforcement in which reinforcement is delivered only after a variable number of responses have been performed.

And so here what happens is for example, certain companies offer you bonuses, or certain payoffs, certain additional payoffs that is what it is. And so there is no way to determine when the payoff will be given to you, or certain kind of thing good thing will be given to, goodies are given to you and that is the variable ratio schedule. What happens is the variable amount of reinforcement, variable amount of work has to be done and that will lead to the reward.

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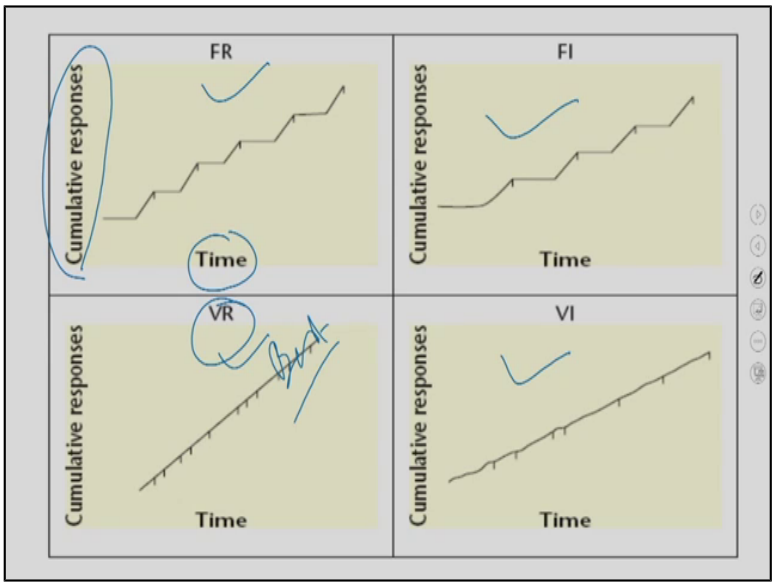


Now, if you look at this, this is my time axis and this is my accumulative responses, the fixed ratio, the fixed interval, variable ratio, variable interval. And so, what happens is which is the best one. The best one is variable ratio, this is the best way of rewarding people as you can see it is a line, and it is a line from 45 degree angle.

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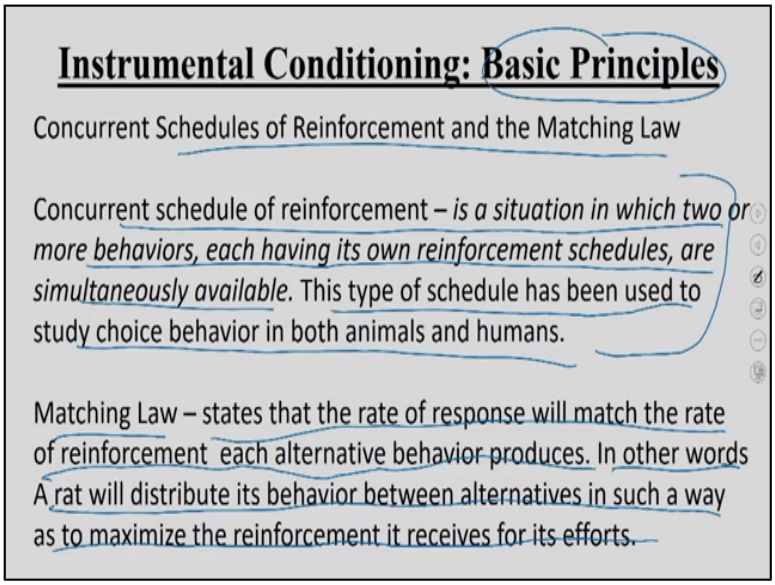


Basic principles, concurrent schedules of reinforcement and the matching law, there is some concurrent schedules also. So, concurrent schedules of reinforcement is a situation in which two or more behaviour, each having its own reinforcement schedules are simultaneously

available. This type of schedule has been used to study choice behaviour in both animals and a humans. Now sometimes what we, what we understand is that; one type of reinforcement or one type of reward is not working. So, what we do is, we use two methods of rewarding people; one based on time the, other based on how much you work you do and. So, what is the matching law? States that the rate of response will match the rate of reinforcement the, which is provided and each alternative behaviour produces.

And in other words a rat will distributes its behaviour between alternatives in such a way. So, as to maximize the reinforcement it receives for it efforts. So, as soon as the employ understands that the reward is based sometime is on time, and some rewards are based on time and some rewards are based on ratio what it will do is. As soon as the time for the rewards come it will start he will start working more. And in terms of ratio what it will do is, it will work more on certain sectors or certain things on certain areas for getting the reward; that is the matching law.

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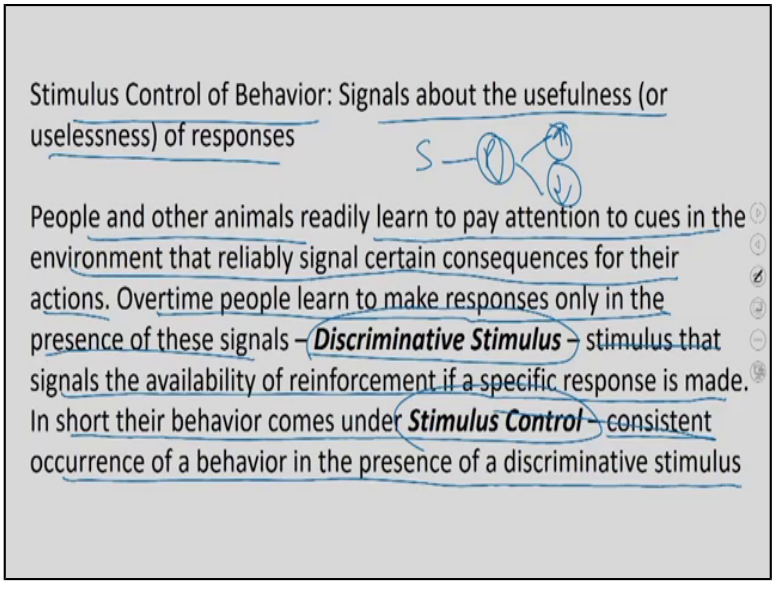


Now, there is also something called the stimulus control of behaviour, signals about the usefulness or uselessness for responses. So, how do somebody know that this response will lead to reward or not, and that is what it is called stimulus control of behaviour. Now people and other animals, they readily learn to pay attention to cues in the environment that reliably signal certain consequences for their actions. Overtime people learn to make responses only to presence of these signals, this is called the discriminative stimulus.

Stimulus is that signal the availability of for reinforcement if a specific response is made. In short the behaviour comes under something called stimulus control consistent, occurrence of a behaviour in the presence of a discriminative stimulus. I will give you a good example to understand that so you read that and I will give you good example, let say that this is the salary day. And mostly on salary days if you want something from your father you approach him, he is going to give you something good, some kind of a good gift, but then this is your parent coming in the, father coming in and this is a salary day. So, you know that on a salary day, ask him something, but then you see him in a good, in a bad mood, do not approach him this is called stimulus control of behaviour.

So, although it is salary day and your, if the stimulus is the salary day and you believe that he has had his money, and he comes back in, but then there has a response that you are seeing, you see that he is not in a good mood, do not approach him; because if you approach him you will never get what you want. And so, stimulus control of behaviour is something like that. On most normal locations on a salary day whatever you ask your father you are going to get that, but if you see him in a bad mood on a salary day, never approach him and that is called the stimulus control of behaviour, because we look at this discriminative stimulus which is the bad mood, which may not make him buy what you want to buy.

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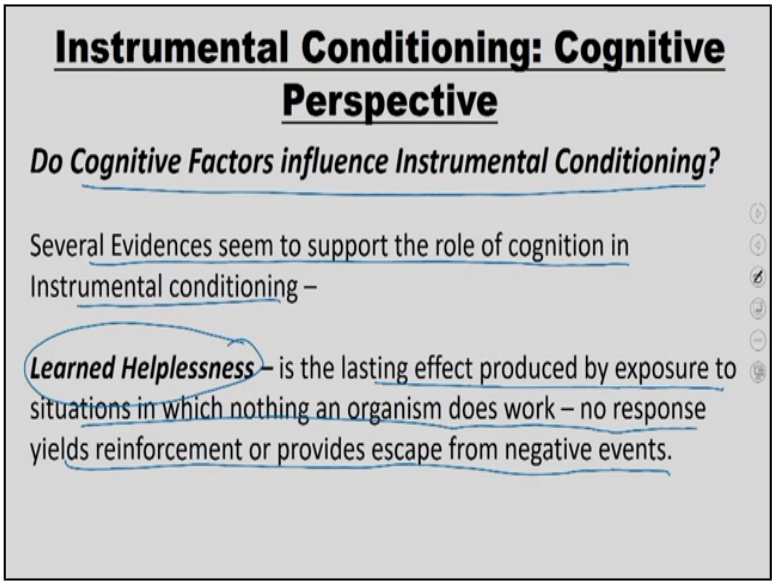


So, do cognitive factors influence instrumental conditioning. Yes, several evidences seem to support the role of cognition instrumental conditioning. For example, one is learned

helplessness. It is the lasting effect produced by exposure to situations in which nothing an organism does work. No response yields reinforcement or provides escape from negative events. Now this is learned helplessness is a technique which has been, or a situation which has been defined by martin segment, what happens is if people see too many negative consequences or too many negatives happenings in their life, they give up everything and they stop responding at all, this is called learned helplessness.

Now in this case is if stimulus responses were based on the reward what would happen, or one of those schedules of reinforcement would work, what will happen is that, each consequence or each response that the subject does, is independent of each other. But what happens is in learned helplessness people look at multiple negative consequences that has happen and this stop responding at all; that is called learned helplessness situation, when people start believing that they cannot do anything on in their life and they give up everything, and so that is says that cognition work, because what happens here is.

It is not stimulus which behaviour or stimulus behaviour related consequences, which is telling you or which is making you learn what has happened is your taught process has made you not produce consequences or not produce responses to stimulus, and so you never get a consequence out of it.

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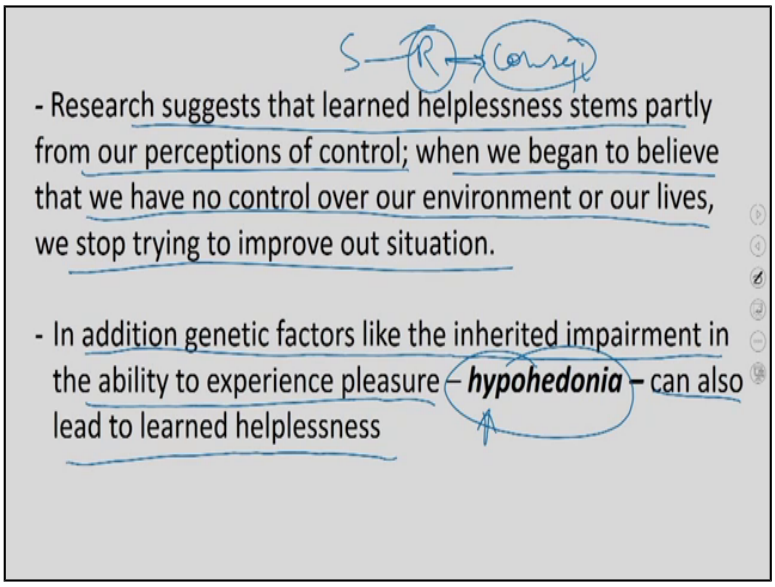

Research suggests that learned helplessness stems partly from our perception of control. When we began to believe, that we have no control over environment or our lives, we stop trying to improve the situation. Now whereas, stimulus gives to response and this response leads to consequences, when people start believing that this consequences are not in their control or not in the control of the responses that they are giving, they learn, they tend to do something called learned helplessness. In addition, genetic factors like inherited impairment in the ability to experience pleasure. For example, Hypohedonia can also lead to learned helplessness. So, there are some genetic factors also which lead you, who are lead people to present this idea of learned helplessness.

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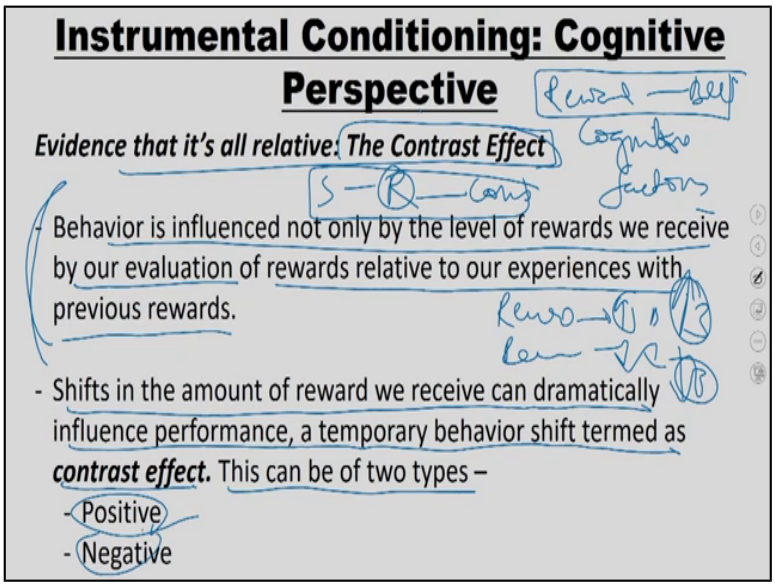


Now, there is also something called the contrast effect which tells that cognition or cognitive factors. Cognitive factors decide operant conditioning. Now behaviour is influenced not only by the level of reward we receive, by our evaluation of rewards relative to our experience with the previous reward. So, it is not only that each stimulus will related to a particular reward, which is related to a consequence, it is not as simple as that. This response that people give to a particular stimulus is dependent also on what previously responses we have given, or what kind of reward we have actually received previously.

Now in this case what has happened is, people when they where there is two group of people one group of people were given reward, high rewards, and one group of people were not given, or actually any reward. And so when they were given high reward their behaviour

surpasses the behaviour of people who had higher rewards, this is called the positive contrast. In the other case people who were not given reward at all and people who were given some simple rewards. So, people started when they were not given reward at all, their performance went very low. So, the experiments runs in this way that when people were give, people were actually given some reward.

Now, when the reward was increased their behaviour increased, manifolds in relation to what that reward was, when a higher reward was given to them, and when a lower reward was given them their behaviour actually went very low, below the standard in comparison to the reward. So, there is no relation between reward and behaviour, and this is determined by, previously how much you are given. So, initially what happened is, a certain amount of reward was given to people a certain amount of reward was given to people, when this reward was increased, behaviour increased almost three times, but when this reward was decreased behaviour decreased by three times, and that basically says that there is a cognitive perspective.

Now shifts in the amount of reward, we receive can dramatically influence performance, a temporal behaviour shift termed as something called the contrast effect. Now this can be of two types; we have a positive contrast. Positive contrast is when the behaviour increased manifold to the increase in reward and negative contrast is, when the behaviour decreases manifold in terms of the reward that is decreased.

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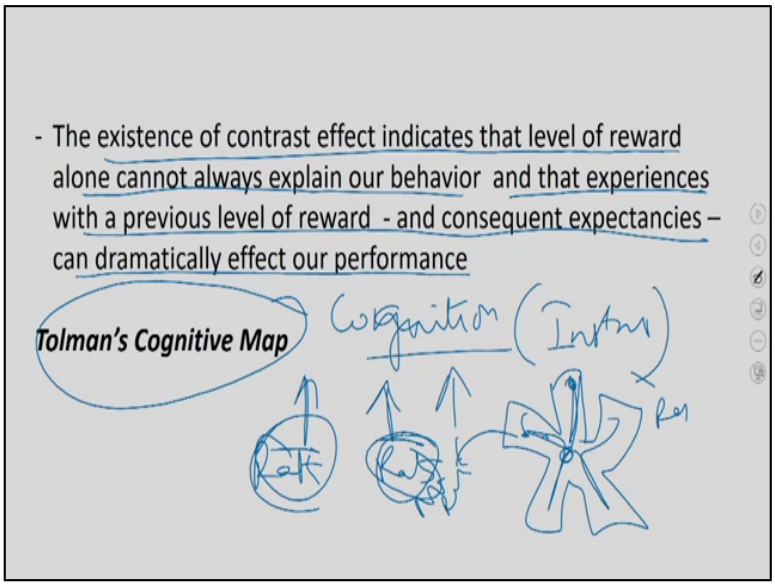

Now, at the existence of contrast effect indicates the level of reward alone cannot always explains our behaviour and that experiences with a previously learned reward, and consequence expectation can dramatically affect our performance. Now there is another interesting thing in terms of whether cognition effects instrumental conditioning. And so what happens here is that, they were three group of three rats. Actually they were two group of rats. So, one rat was, and these rats were placed in a maze. So, we have something called 8 arm radial maze. And so what happens is the rat was put here and a food was put here.

So, one group of rats was actually given food and a reward, and so this rat when given a reward, this group actually went ahead and started going from one end to the other or trespassing this or traversing this radial maze. There were other group of rat who was not given anything, so they were put here and this rat had no reward, and so they were not doing anything. Later on the second group of rats who were not given a reward to start with. So, no reward group was given a reward and so when given a reward, these rats perform better than the rats who were actually given a reward to traverse this maze.

And this basically says that what the rats who were not given a food they were not just sitting down, they were traversing the maze and they were learning something and they from something called the cognitive map. And this cognitive map actually helped them in traversing better than or doing performing better than the rats who were getting no reward and that is the reason that this rat perform better. It basically means that it is not only reward that is going to work. What is going to work is, the cognitive factors of how you think and something like that.

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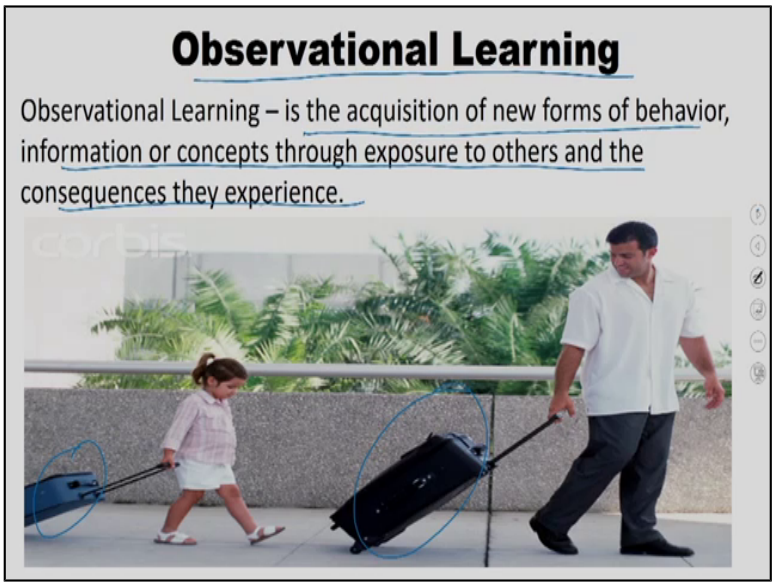


And the last section that we are going to do today, is something called observation learning. So, what is observation learning? Observation learning is the acquisition of new forms of behaviour, information or concepts through exposure to others and consequence that they can experience. As you can see, here is the father when he is tilting his bag at a 45 degree angle and the, and the child sees that this is the best way, or child sees that this the father can effort effortlessly move the bag, the child also tilts the bag at 45 degree and starts moving forward.

So, basically what is observation learning? Observation learning is a process, where you actually see someone act in a certain way and when you see him getting rewarded or awarded, because of their act, you follow that particular behaviour, because you want to get awarded in a similar way.

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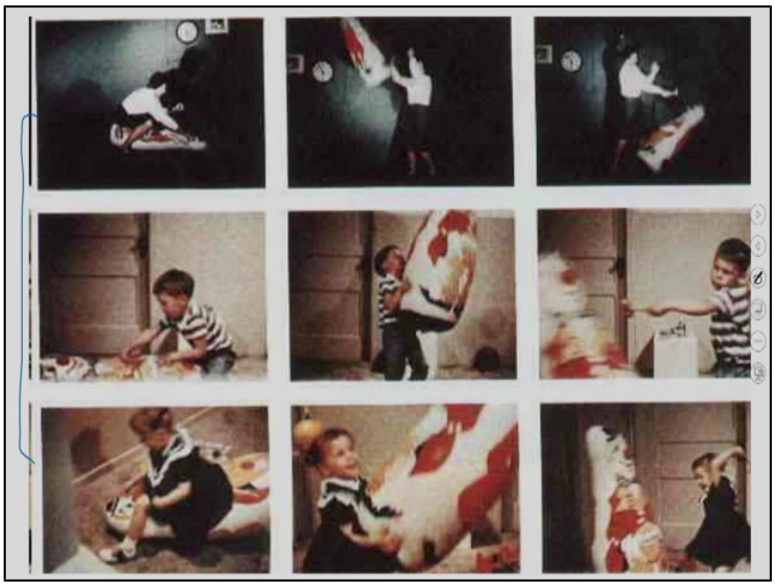

Now, this is the consequence or this is the demonstration of Albert Banduras aggressiveness principles. So, what happens here is that Albert Bandura took group of people or group of children and showed them aggressive movie. So, one group of children saw an aggressive movie, the other group of children saw a non-aggressive movie, and after that they were put in a room after the aggressive and the non-aggressive movie.

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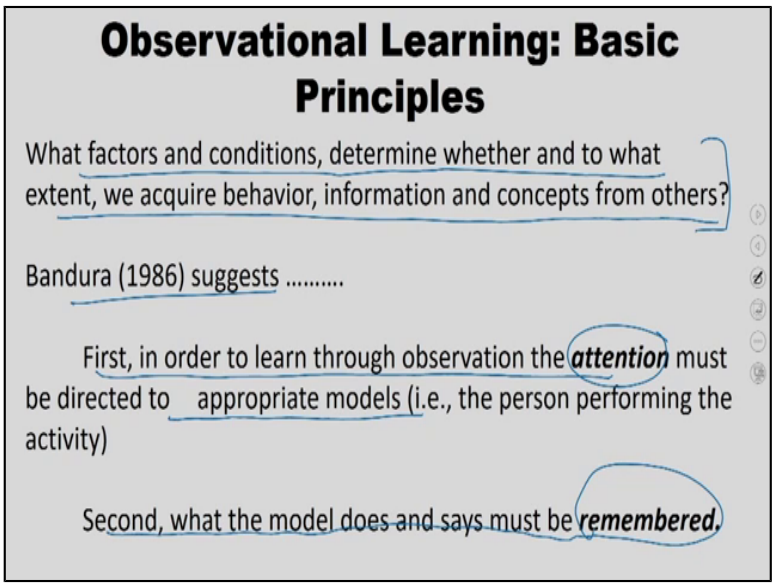


So, aggressive group was put in a in a room with a bobo doll, and the non-aggressive group was also put in a room with a bobo doll. Now people children who actually saw aggressive

movie started beating the doll more and the children who actually saw the non-aggressive movie started playing with the doll, which basically means that the observation or getting rewarded. So, aggressive group actually saw the hero being rewarded for doing aggression. And so they learned that and non-aggressive groups saw that, not doing any aggression also is rewarded and so do they do that.

So, what factors conditions determine whether and to what extent we acquire behaviour information and concept from other. So, how do we learn from others. Bandura 1968 suggest that first in order to learn through observation, we have to put something called attention must be directed to appropriate model. We have to choose whom do we want to copy, we have to find out the right model to be copied.

Second, what the model does and says must be remembered. We should also be able to remember what the model is doing. If we do not remember what is the act that the model is doing for which it is being rewarded, then it is not going to work in anyway.

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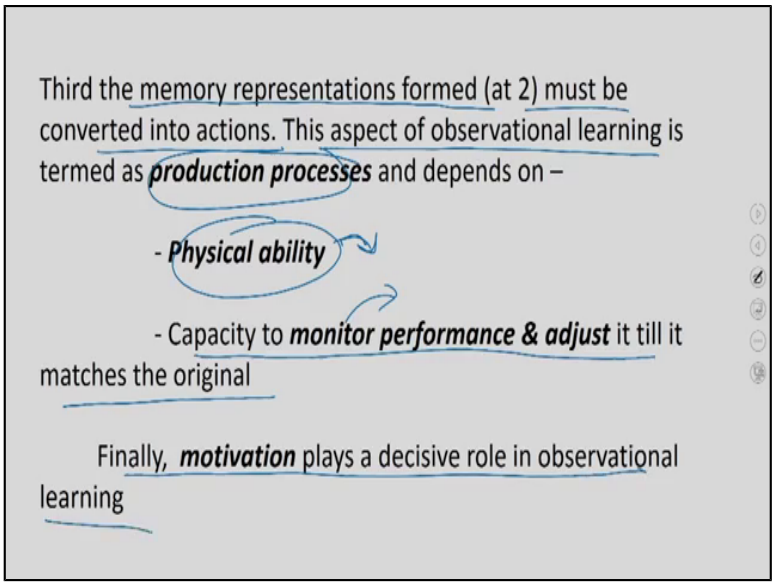


The third is the memory representation form at two must be converted into actions. Now this aspect has been something called the production process, and that depend depends on something called the physical ability. So, whatever the model is doing, whatever you have learned from the model and put into memory for that has to be produced back. Now first that depends on two factors, whether you have the physical abilities.

So, a smaller children are there and see this year larger model, taking a gun and hitting someone, they do not have the physical ability to do that and so they cannot repeat that act. Also capacity to monitor performance and adjust till it matches the original. So, the first is whether people have the physical ability and the second is, can you monitor your performance. So, a something goes wrong, if the model does not act, you remember you pay attention to that model, you remember that and from memory you are able to produce it. Now once you produce it of course, there will be errors.

Now do you have the ability to monitor what was the errors that you are doing in comparison to what the model is doing. And do you have also the ability to not only monitor it, but also correct it. If you have that ability then you can actually learn from models. And finally, is the motivation plays a decisive role in observation learning. The last thing is if you have no motivation at all to do the act, you will never learn anything from observation learning.

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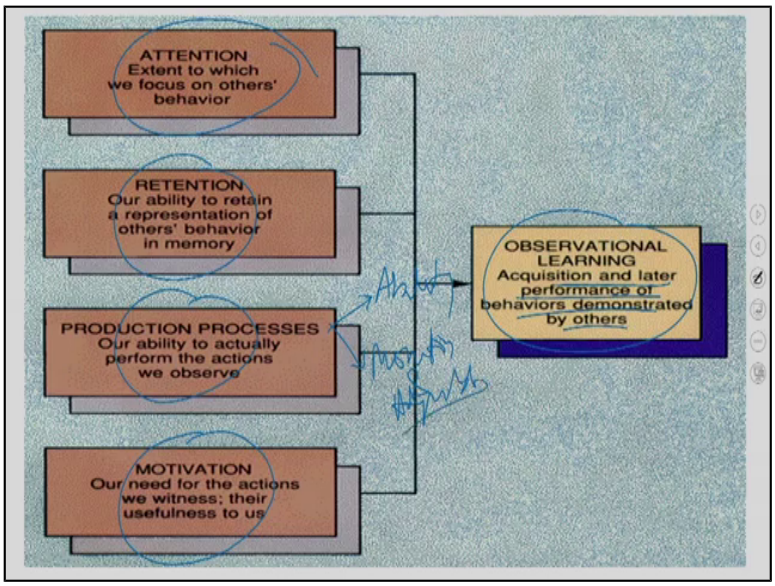


And so observation learning the acquisition and later performance of behaviour demonstrate by others, depends upon something called extension, detention, production process and motivation. And production process is two step, it depends upon the ability that you have, the physical ability, also not only the physical ability, but also the monitoring process, can you monitor and adjust. These are the two things that is required for observation learning to function.

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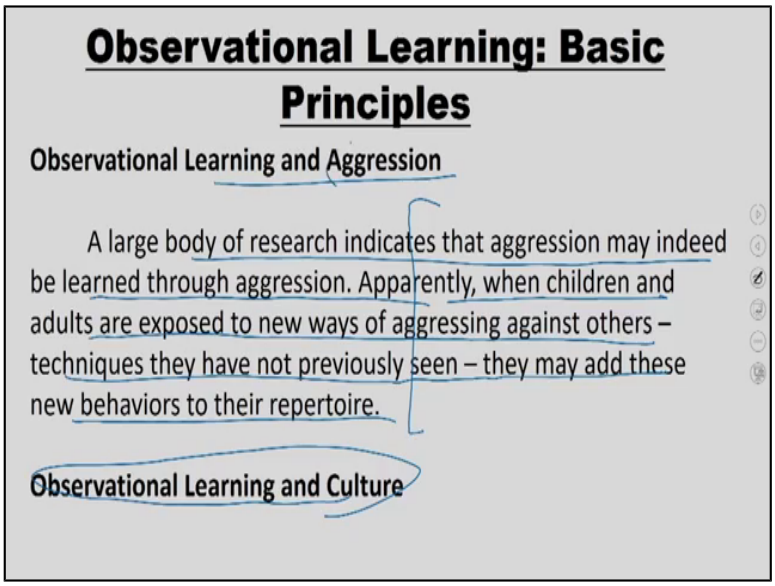


Now, observation learning and aggression: a large body of research indicates that aggressions may lead, be learned through aggression. Apparently when children and adults are exposed to new ways of aggressing against each other, techniques they must not previously seen, they may add these new behaviours to the repertoire and the last thing to be looked at is, observation learning and culture. So, basically this observation learning also varies from culture to culture. For example, some cultures are very good in terms of observation learning, but at other cultures they are very bad at observation learning.

So, observation learning is also dependent on certain cultures and the way these cultures respond to observation learning. Now this part basically explains the fact that how aggression and observation learning works. Because what happens is, when somebody sees be other person being aggressive and because of that he is being rewarded, we tend to align ourselves with that aggression and we do one exact act which is matching that aggression. So, that keeps an, or that brings us to the end of this section on learning. And what we did today was we looked at, what is called instrumental learning.

So, we went into the basics of instrumental learning what it is, what does it encompresses, how it is done and the basic principles of reinforcements and punishments. And not only that we also looked at the factors, the cognitive factors and other factors which actually encompass the instrumental conditioning.

Further to that, we also looked at what is observation learning, what are the factors of observation learning and how does observation learning actually is performed. So, observation learning is a simple facts, where you copy a model. Let say you go to a restaurant, now when you go to a restaurant how do you eat something, let us say that there is French food how do you eat something. So, you see someone around who is eating. Generally you go to a restaurant. I will ask you a simple question, let us say that there is a food. So, which hand should you use the knife and which hand should you use the fork.

Now that comes from the fact that by observing people in the restaurant you learn these things and that is what is observation learning. And for that there are four steps and you have to follow those steps, or you have multiple forks. So, which fork should be used for eating the salad for the food and so on and so forth. So, basically learning these things or how copying others leads you to betterment or better learning is what is observation learning all about. So, this section was mainly a second section a continuity section on what we did on learning. Next section we looked into more related factor, which is called memory and until we do that from now, from here it is good bye.