Introduction to Psychology
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Lecture – 14
Learning: Operant Conditioning

Today we are going to talk about the second important theory learning; what is called as Operant Conditioning.

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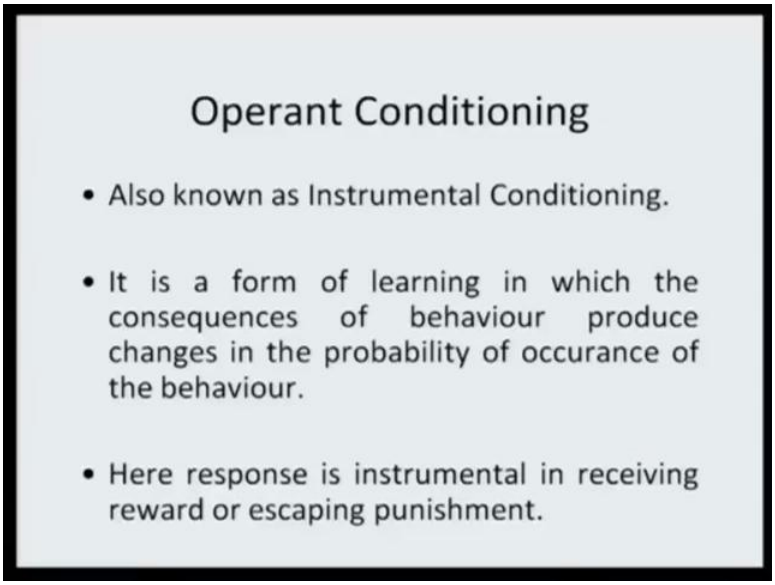

Operant conditioning is also known as instrumental conditioning. The reason being that the animal concerned or say the person concerned his or her behavior or its behavior basically has something to do with the anticipation of the probability of the occurrence. So, unlike a classical conditioning where you saw pabulums dog being passively getting conditioned to celebrate on the sound of the bell; instrumental conditioning is different it is basically a form of learning in which the consequence of the behavior produces the changes in the probability of occurrence of that particular behavior.

So, the responses they are instrumental in receiving rewards or escaping punishment. So, reward or punishment that is something which becomes important, so either you want to

receive the reward or you want to escape the punishment and this in turns keep shaping your behavior and you get instrumentally conditioned. B F Skinner who was the man who gave this very concept and you saw in the beginning the pigeons at Mumbai.

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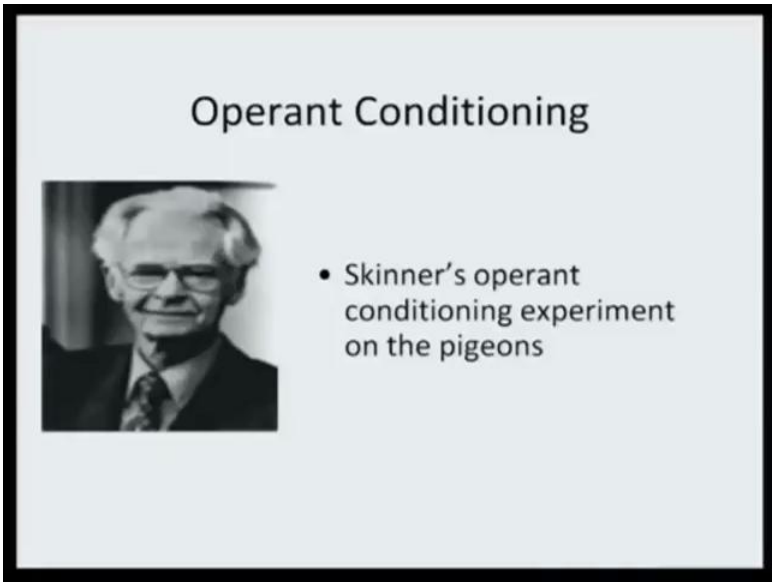

Skinners operant conditioning experiment was based on the study of pigeons in the lab.

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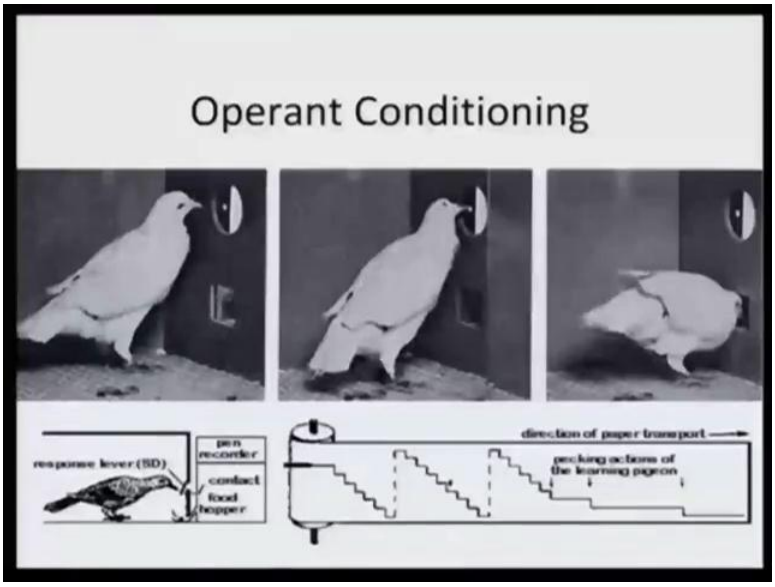

So, now this was what the experimental protocol was. The pigeon was put in a cage and as you can see here colored space and exactly in the center here the pigeon was suppose to peck here and once the pigeon would pick that very specific location as you can see in second image this very image then you realize that the foot pallet use to come out. Every time you pick at the right point the foot pallet will come. This is the location from where the foot pallet uses to appear.

So, repeatedly the pigeon was getting trained to peck at a specific location in order to get food. And as you can see here the box was basically designed specifically for this very purpose. If you see this very image the response lever is put here and then the beak of the pigeon, this very point had basically a metallic surface attached to it which in turn used to help the pen recorder. And here you see the drum here. This paper roll will keep moving in this very direction, so paper will move in this very direction and then based on the pecking behavior of the pigeon the pen will keep recording it on the paper. So, here now what you see here this is basically the pecking behavior.

So, this is how you know in very beautiful manner much more objectives scientific manner B F Skinner conducted his research on pigeons. And this gave him precise information as to how reward works in the case of a these very pigeons and this lead to a mega theory in learning what is called as Operant Conditioning.

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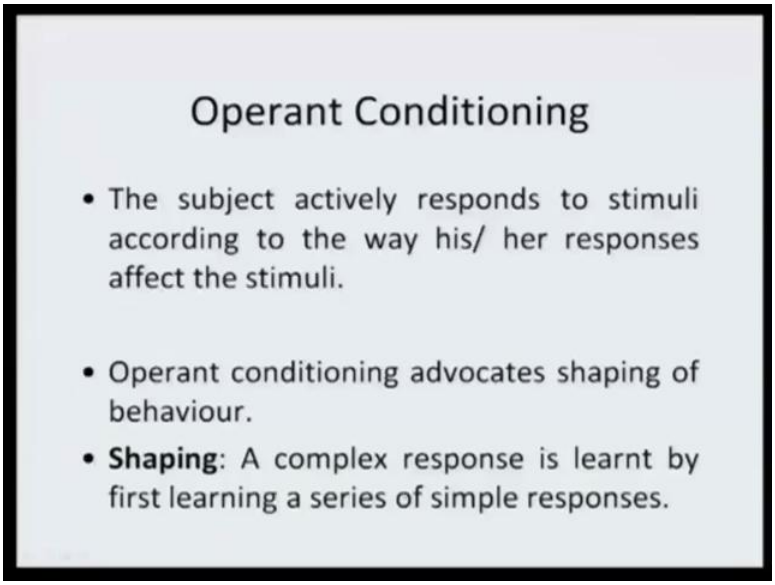

Now, in the case of operant conditioning the participants they actively respond to the stimuli, according to the way his or her responses affect the stimuli. Therefore, it will always look at how either the organism is trying to escape the punishment if it in case it happens to be an obnoxious type of stimulus or the tendency of the respondent of the subject the participant to get rewarded for the behavior that one is coming forward with. That is the reason why operant conditioning basically is considered to advocate shaping of behavior. So, how you behavior gets shaped, and this shaping is dependent on basically the receiving of the reward or escape of the punishment. And shaping basically in psychology is considered as a complex response which is learnt by first learning a series of simple responses.

So, you must have seen you know tabular how they learn how to walk. So, you learn small steps first and then gradually you combine them to learn biggest things. You learn simple set of responses and then you combine them together this creates a learning of a complex concept. Whole behavior gets now shaped and therefore later on when the organism responds in that very given situation and primarily you look at the fact that the entire behavior finally becomes a complex response against a given stimuli.

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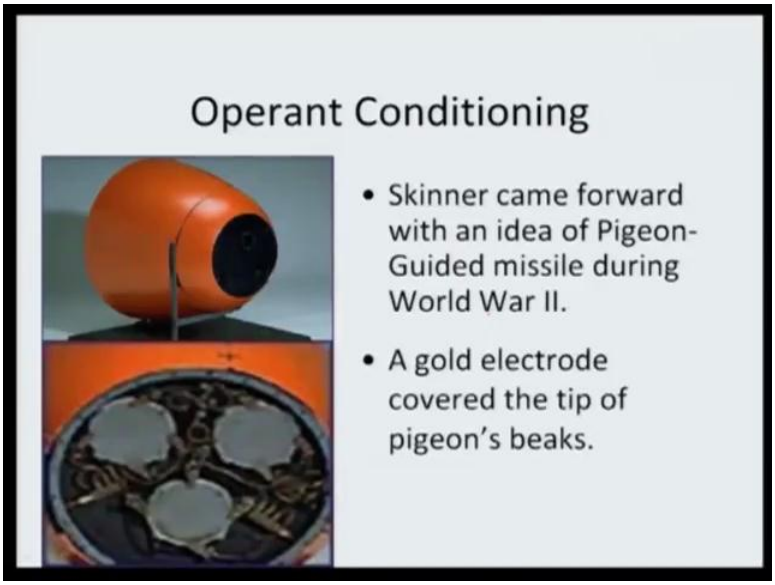

One very interesting aspect before we go into the details of operant conditioning was the fact that Skinner also came forward with the idea of Pigeon-Guided missile. Remember that was the time when World War II was in progress what he had done is that once again he had a gold electrode that covered the tip of the pigeon's beaks and you see the war hit of the missile.

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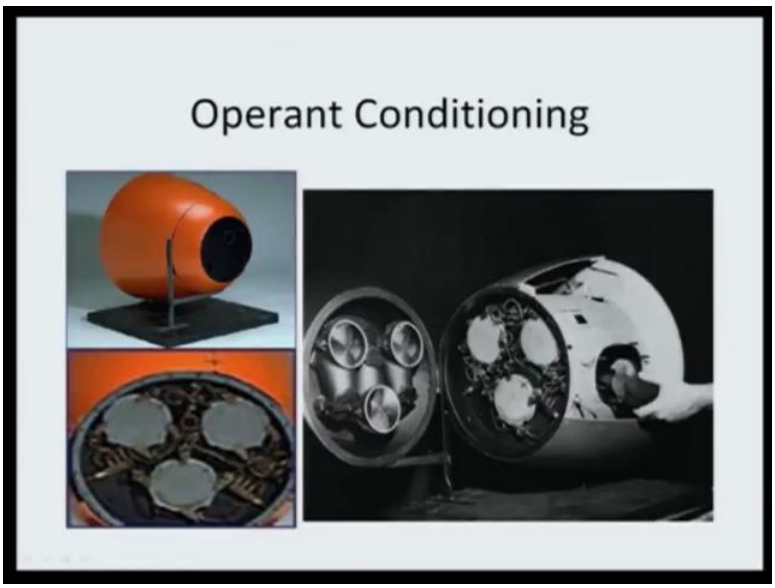

What he had done was as you can see in the figure here this is just one of the holes where one of the trained pigeon was being kept here.

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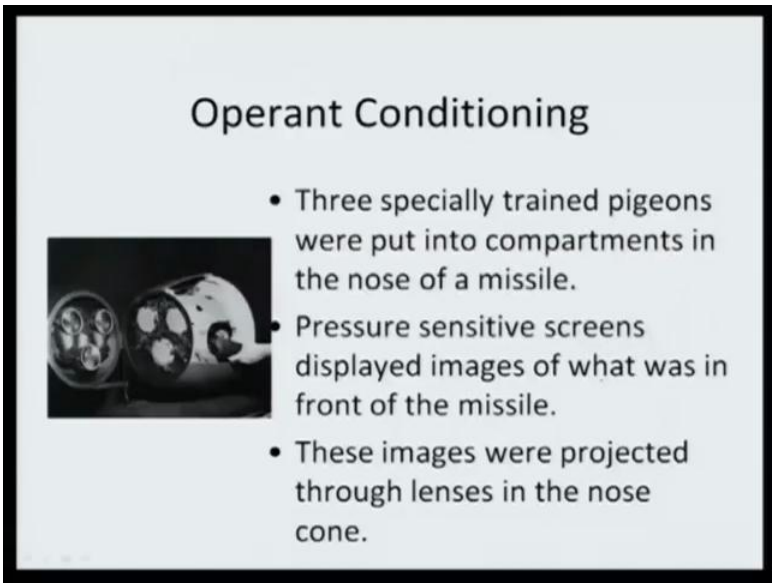

So, in the nose of the missile which had three compartments three specially trained pigeons they were put there and the pressure sensitive screens are displayed the image of what was in front of the missile. These images were projected through the lenses in the nose cone and because these pigeons were specially trained.

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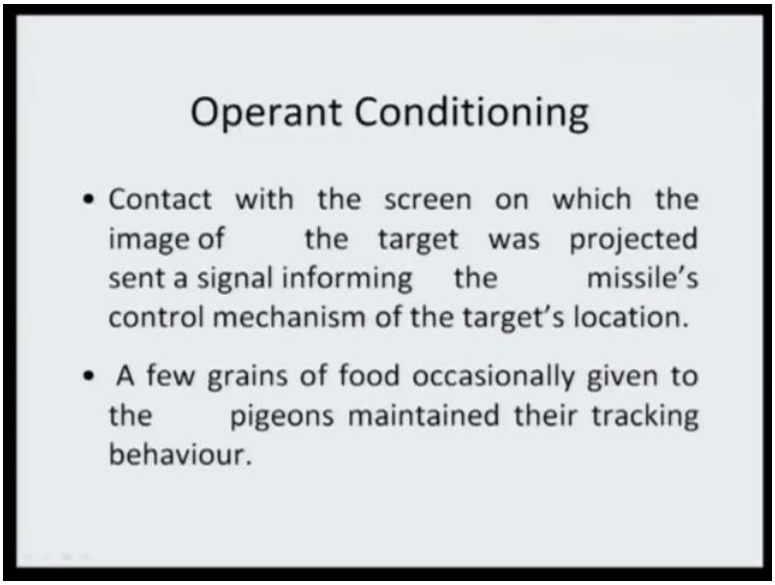

So, what use to happen is that; the contact with the screen on the image of the target was always projected sent a signal informing the missile's control mechanism to the target's location. And the few grains of the food will occasionally now it was given to the pigeons in order to maintain their tracking behavior, because the pigeons were trained to peck at a particular location in order to receive food so they kept on and maintaining the trajectory of the missile because their correct pecking lead to a positive result basically they were getting two food grains.

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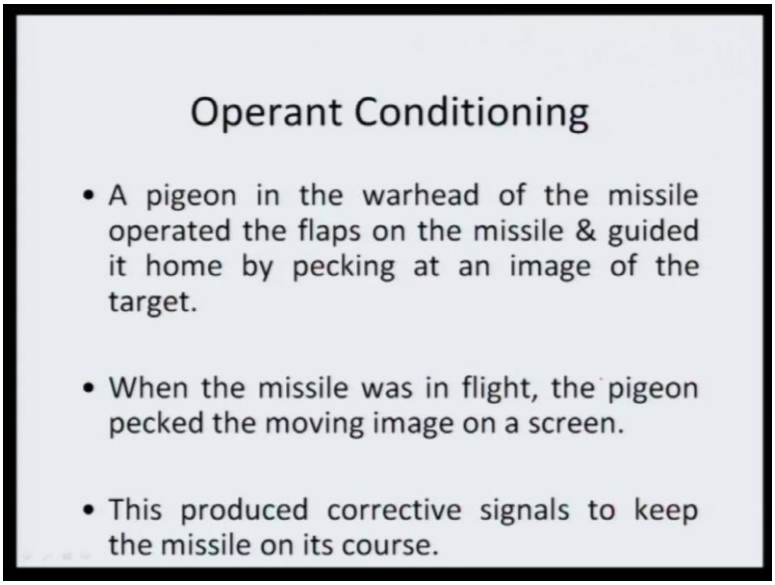

Now, the pigeons in the warhead of the missile operated the flaps on the missile and guided it home by pecking at an image of the pre target. And when the missile was in flight the pigeon pecked the moving image on the screen. So, this produced corrective signals to keep the missile on its correct course.

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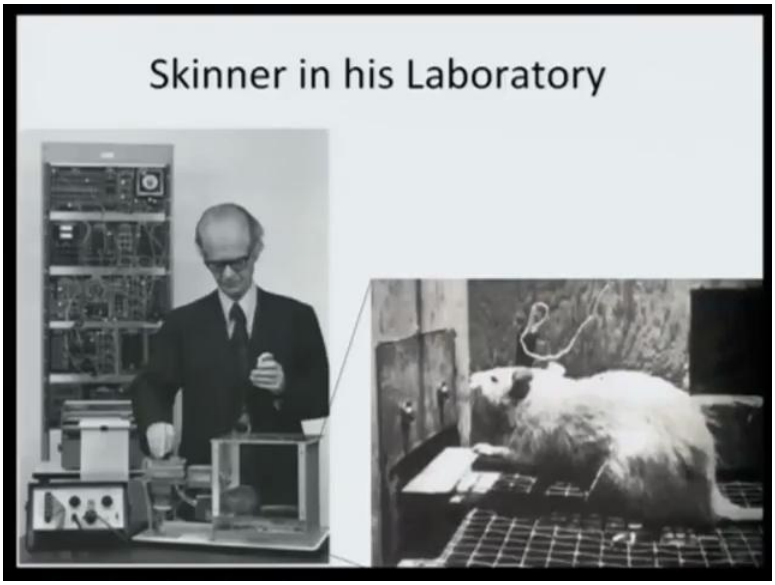

You can see on your screen right now Skinner busy with his instrument. As you can see here he now subjected those animals in a particular box which after his name is nowadays called Skinner box. In the earlier experiment he had the pigeons and you also saw the pigeon guided missiles. Now you see white rats being used for experimental purposes. And pigeon was a case where the reward was taken into account the pigeon was suppose to peck at a right location and this lead to repeatedly rewarding the pigeon while giving two food grains.

In this case as you can see this Skinner box a rat was kept there and this was the experimental demonstration of what you call as the tendency to escape punishment. This rat was subjected to electric shocks which used to come in the metallic grid that you see at bottom of the cage or the floor of the cage. And in order to now escape the mild electric shock the rat had to make certain desired movement. And that is desired movement would basically help the rat escape the electric shock. So, this was basically again making the rat learn how to respond, but this response was not in order to receive a reward this response was basically in order to escape the punishment.

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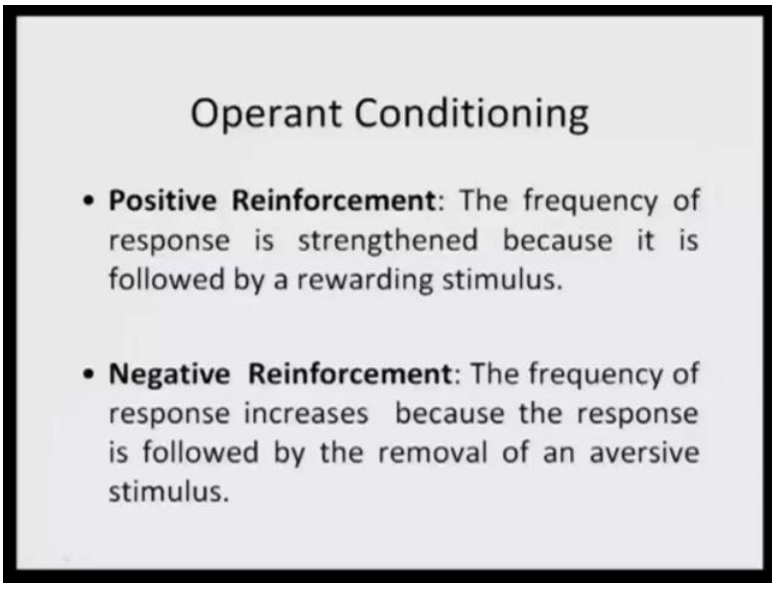

So, basically what operant conditioning said was that we have two types of situations. You can have positive reinforcement that would shape the behavior or it could be

negative reinforcement that shapes the behavior. Positive reinforcement basically the frequency of response gets strengthened because it is followed by a rewarding stimulus. So, you do a behavior desired behavior and the desired response in turn gives you a reward, whereas in the case of negative reinforcement the frequency of the response increases because the response was followed by removal of the aversive stimulus.

You saw the first case positive reinforcement was the case of the pigeon, because the response of the pigeon got strengthened because every time it would come forward with a correct response reward would be given. In the case of the white rat basically it was removal of the aversive stimulus. So, mild electric shock was given to the rat. And the response increased because the rat realize that by giving this type of response by giving a particular type of response it could basically make itself escape the punishment that it was experiencing, the aversive thing the electric shock that got revoked.

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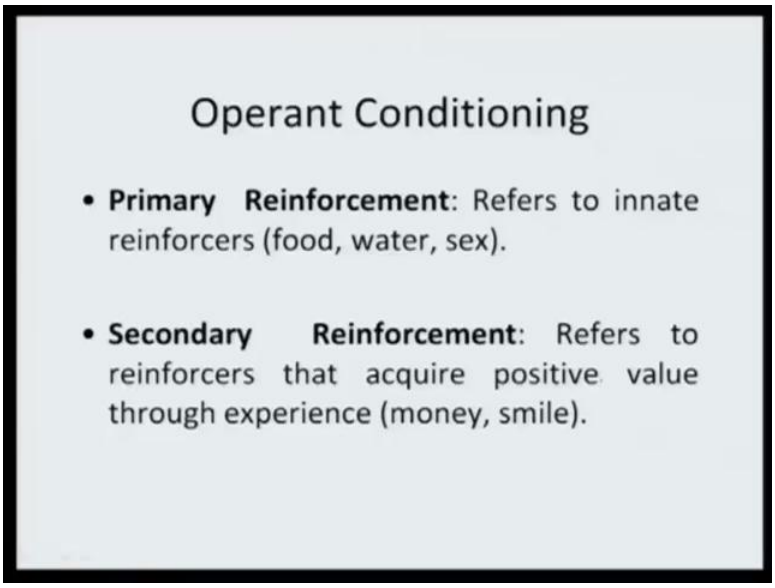

Now, besides considering the reinforcement as positive and negative reinforcements in terms of especially human beings you can also think of primary and secondary reinforcement. Now remember one thing in human beings also positive and negative reinforcements will work, but the way various factors that motivates us to perform certain type of act some of these you would realize are biological driven; hunger, thirst,

sex and sleep they are biologically driven. Whereas many other things such as appreciation, such as a token of simile such as so giving some money or recognizing you by conferring an award to you these could be secondary reinforcement. In the case of human beings we realize mostly that we could have a conditioned behavior that comes out of either primarily reinforces or secondary reinforces.

Primary reinforcement it basically works in the case of innate behavior; if you are given food for behaving in a particular way, if you are given water, if you behave in a desired way, if you are allowed to have sex because you give the desired behavioral outcome. So, provision of providing food water sex would be considered as an example of primary reinforcement. Whereas cases where now you consider the reinforcement as positive, but it is not basically dependent on your in innate biological tendencies but they you give things which are otherwise socially acceptable. You have learned to value those things through your experience. Say for instance you come forward with a desired response and then you are given a reward of say 5 Lacks that is the prize amount, it is the value of a now the award that becomes reinforcement for you. Or simply the fact that everybody gives you standing ovation; people stand up and clap for you. Or even situation when know your near and dear ones; those who now basically have value in your eyes they just give you simile which would work as a positive reinforcement for you.

Now these are secondary reinforcements. So, human beings you would realize that they are not only guided by a primary reinforcement, but they are also guided by secondary reinforcement. Consider this very situation.

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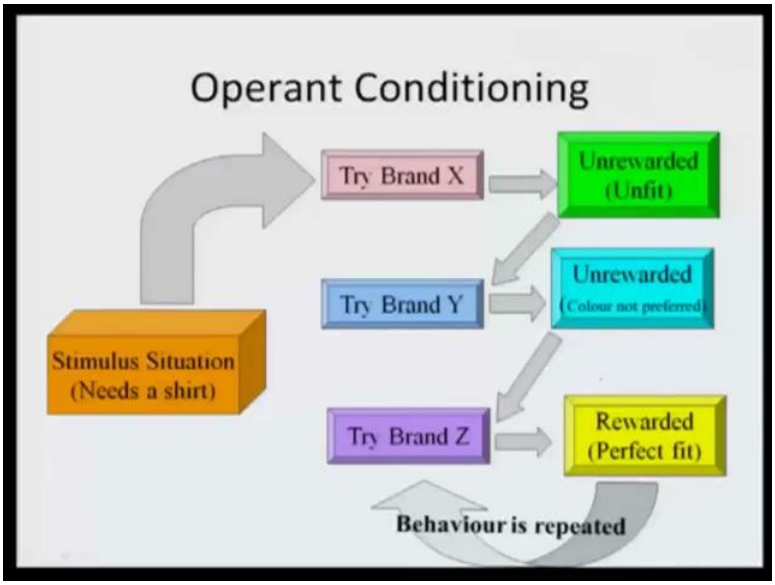

You are in shopping mall and you are trying to buy a new shirt, you need a new shirt so what do you do. You enter a mall go to an appropriate shop and then say for example you have tried brand X. This very behavior does not lead to a rewarding type of an outcome; you realize that the shirt is not fitting you it is an unfit. You drop that you go to brand Y the shirt fits now, but then you realize that find the color is that attractive those who are know along with you your friends or your family members they tell you that now even though it is a fit, but then you will now the color is not so attractive it is dull. You drop brand Y also.

You try brand Z and then you realize that it is not only perfect fit, but even the color the print is very attractive. What you do now? This very reward does not only allow you to buy that very shirt at that movement, but later on when you will go for shopping the next time instead of trying brands X and Y you will jump to brand Z because now you know that it is brand Z which might you give the colors of your choice and it also tells you that find brand Z will largely also have those shapes of the shirt which fits your body. Now, the entire purchase behavior is controlled by operant conditioning and the reward that you get out of a given situation

. The way we discuss important concepts in classical conditioning let us now talk about important concepts associated with operant conditioning.

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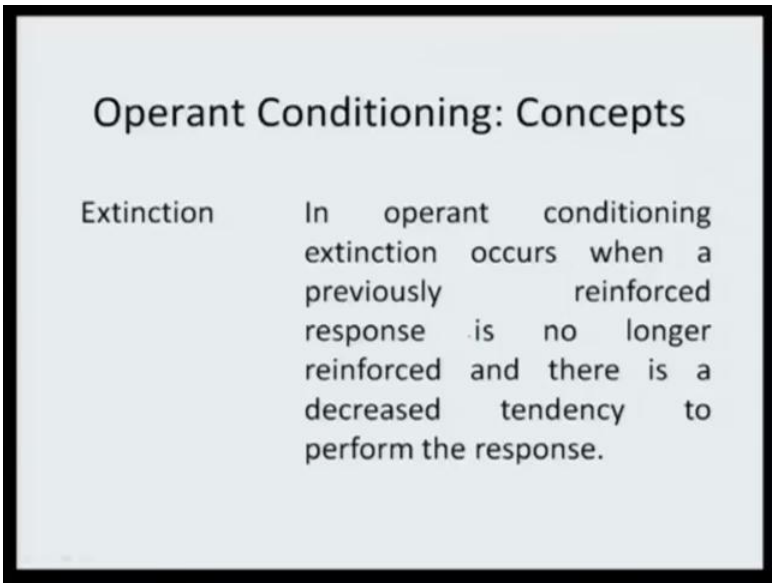

Similar type of things one the process of extinction; what we had discussed earlier the way we have defined extinction it is exactly the same that we were going to talk about here. In operant conditioning extinction basically occurs when you realize that the previously reinforced response is no longer reinforced. So, something that was appreciated that was being given our reinforcement you realize that the reinforcement is not being given and once the reinforcement is not being given that specific response starts diminishing.

So, the tendency of the individual to give that very response goes down it is longer there simply because the reinforcement has also not being given in that very situation. So, removal of a reinforcement that leads to complete spreading out of the desired response it is called Extinction.

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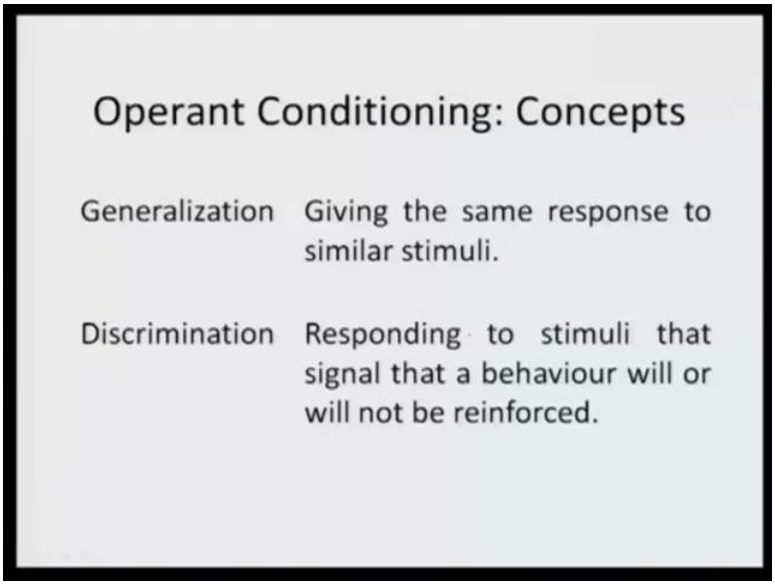

Again generalization and discrimination are two important considerations here. Generalization would mean that you give the same response if you realize that the stimulus is the same. In the case for the example of pigeons near Gateway of India in Mumbai you realize that whether you throw the gain on the ground or you hold the grain in your own palm the pigeons come and they peck they eat the grain. So, where the grain is not important, so even though the situation has changed you realize that the stimuli are by and large the same. It is the food grain which was in case lying on the ground on the other case if it is somebody's is holding it and therefore the response is extended there that is generalization. Same response if there is similarity in terms of the stimuli that is being given.

Discrimination would be the reverse of generalization. Responding to stimuli where you realize that the signal somehow is not the same. If you realize that you are reinforcing one condition you realize that it will not be reinforcing the other condition, because you know that this will not be enforcing the other condition you do not do that.

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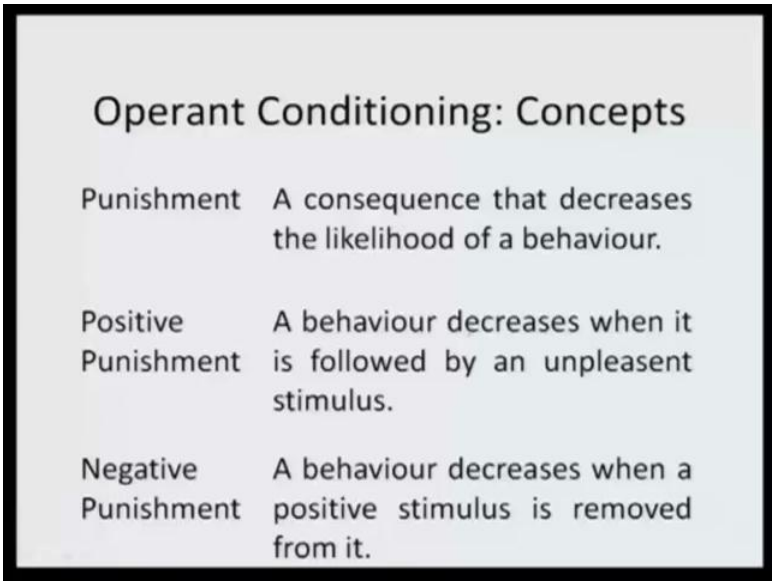

Important concept also in operant conditioning is of punishment. Punishment basically a is a consequence which decrease the likelihood of the behavior, because if that behavior is again and again repeated every time the individual would be punished for that very act. And if you realize that the likelihood of punishment is increasing because of reputation of the behavior you finally decided this is a non do able type of an act you do not perform that. Now punishment can also be positive and negative in nature. This is something very interesting to understand in psychology. By and large we understand that punishment is punishment and therefore the common seneschal understanding of punishment is that it is negative. Primarily technically speaking punishment could be positive it could be negative.

Now a behavior decreases when it is followed by an unpleasant stimulus. Decrease in the behavior when it is followed by pleasant stimulus that is positive reinforcement, but if the behavior decreases when a positive stimulus is removed. So, in one case it is followed by an unpleasant stimulus and in the other case you realize at positive is stimulus is removed, in one case it is given in the case of positive punishment it is withdraw it is removed in the case of negative punishment. So understand one thing, reinforcement could be positive negative and similarly punishment can also be positive as well as negative.

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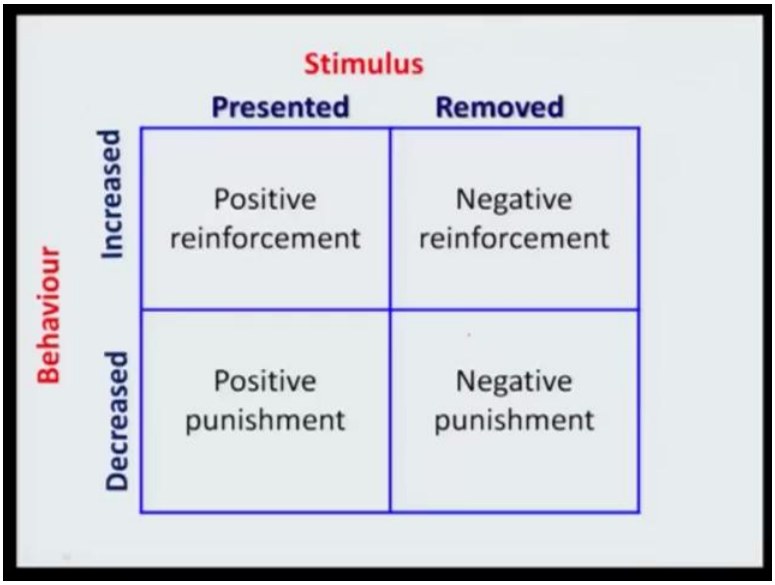

Let us now understand positive negative reinforcement and positive negative punishment once again using this very grade. In this case you have this stimulus. So, you thing of two conditions it is a two by two table know exactly the way we had talked about the signal detection theory in the case of perception, where the signal was presents signal was absent the response was either yes or no. Here either the behavior increases or the behavior decreases. Second vase where the stimulus is present or the stimulus is removed it is not present.

Now what happens remember this if the stimulus is present and the behavior also increases; this would be a case of positive reinforcement. Why, you gave the stimulus and the behavior increased so this is positive reinforcement. You remove the stimulus and removal leads to increase in the behavior that is negative reinforcement. Now increase in the behavior has been taken care of, now we are not talking of increase in the behavior rather now we are talking about decrease in the behavior. Now think of the situation.

So, we now come to the second situation we are not talking about increase in the behavior remember earlier we were talking in with respect to increase in the behavior we are now talking about decrease in the behavior. So, the result finally is going to be

decrease in the behavior and again stimulus you think in terms of presenting the stimulus or you thing in terms of withdrawing the stimulus reviewing the stimulus. Now if the stimulus is presented, so now you have presented the stimulus behavior decreases and this will this will leads to positive punishment.

So, you present the stimulus leading to a decrease in the behavior positive punishment. Removal of the stimulus and this lead to decrease in the behavior this is considered as negative punishment. Having understood the whole concept of classical and operant conditioning let us now know try to make a distinction between the two, this we will do in our next lecture.