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Marketing Research

Lec -13

Introduction to Marketing Research

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Department of Management Students

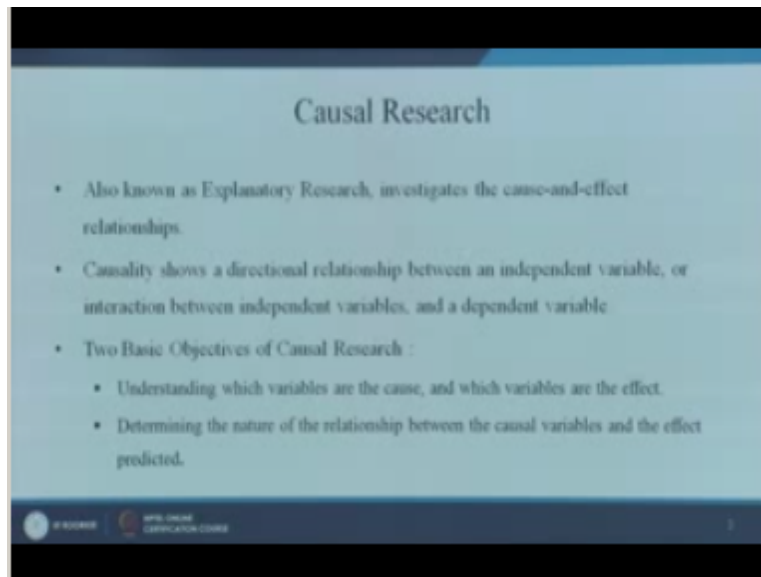
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Welcome everyone to the class of marketing research and analysis in our previous classes we had discussed about the research design we spoke about exploratory research and its types then we did with descriptive research okay and which is basically was a part of the conclusive research design as we have stated earlier conclusive this was a inconclusive right no conclusive so one more image in the conclusive research is a casual right.

So I hope we all remember in the descriptive we had started discussing about that do in the descriptive research the researcher test is hypothesis which he as formulated may be during the exploratly condition in the exploratory research he as formulated or he has developed the hypothesis and then this testing of hypothesis is done in the descriptive and the casual stage right in the conclusive stage so what is basically the casual as the name suggest casual is basically as early as I said it is a cause and effect study.

Okay it is casual effect study so most of the principles of you know nature or you see for example the neutrons gravitational force or anything we talk about is basically nothing like a causal effect right so the apple fell because there was a gravitational force okay the sales of a company increases because of may be advertising right companies like pay tm and all as posing cricket events for example the cricket test match series or the world cup the football league for example somebody is posing the Weldon all these they are doing because to increase the sales and they present brand value in the market okay so basically what is let's see what is the casual research right.

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Also known as exploratory research it investigates the casual effect relationships as I said right so causality shows a directional relational ship that is very important to understand it is a directional relationship between and independent variable or interaction between the independent variable and the dependent variables now what does it mean it means that let us say the basic equation of regression is $y=a+bx$ where y we say is our dependent variable the x is our independent variable a is our constant or intercept you can say okay b is the slope right so how much change happens in y due to change in x is what we do in a casual effect study basically so purpose there is only one variable we say it is x there could be more than one variable also x_1, x_2, x_3 goes on to x_n .

Okay now theses variables will have an effect on the dependent variable y so how it is effecting and what is the relationship is it for example let us say we will say that trust effects okay loyalty so loyalty is my dependent variable and trust is my independent variable so if there is a change in trust automatically my loyalty or patronize for the store or company will wise versa increase or decrease okay so what is the relationship so if it is positive or negative that matters okay two basic objectives of casual research is to understand which variables are the cause and which variables are the effect right so it is you have to understand which is my dependent variable in this case it is not wise versa it is not that you know trust becomes trust is my dependent variable it cannot be and loyalty in mine independent no right loyalty is my independent variable.

So what I'm saying here is it is not possible right so trust cannot be will not get effected by loyalty right it cannot be for example you see so as I'm saying loyalty changes because of trust here trust does not change because of loyalty not the wise versa so one is to understand in there are several variables for example let us say what effects the popularity of a popularity of a brand or a company let us say now it could be several factors right several factors could be the quality could be the kind of promotion right could be the record or the success factors right so many things are there.

So popularity is may be dependents upon theses so one has to understand what are independent variables or what is my dependent variable and what are the variable that are effecting those dependent variables right independent variables determine the nature of the relationship between the casual and the effect predicted now for example you must have seen many diagrams or you know any hypothesis testing the relationships are given like this let us say x effects y okay y and x also effects let us say a for example now this data effects let us say positively this it has effects negatively so the relationship between x and y is a negative relationship but x.

And a is a positive relationship so that as also has to be seen the researcher has to determine and this determination comes from or determining this comes from basic understanding of the theory behind the process okay so one is to be very careful what kind of events would happen and what is the literature studied behind it right what is the backing.

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Causal Research

- **Causal research** is used to obtain evidence of cause-and-effect (causal) relationships.
- A type of conclusive research where the major objective is to obtain evidence regarding cause-and-effect (causal) relationships.

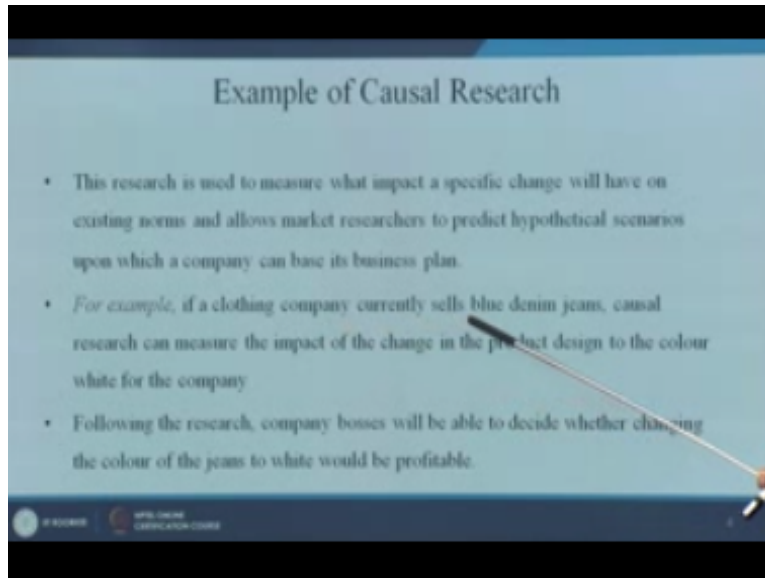
An example of causal research would be a restaurant wanting to find out why fewer customers were demanding one of its sandwiches, so management might experiment to find out if possibly the sandwich's current price or a new competitor's presence in the area would be a cause.

CAUSAL RESEARCH

Let us take in an example of a casual research would be a restaurant wanting to find out why fewer customers were demanding one of its sandwiches so the management might experiment to find out if possibly the sandwich current price was a problem because of the fewer demands or a new competitors presence what was the cause so what is the cause to suppose he wants to know what is the right people are in the demand is not much.

So was it because the people felt the price is high that could be 1 or was it because that there is new competitor in the market new hotel or restaurant coming of which is providing the same surveys at a better affordable price or better quality which has become the reason for the demand or poor demand so there is some more examples for example is have given it is a clothing company currently says

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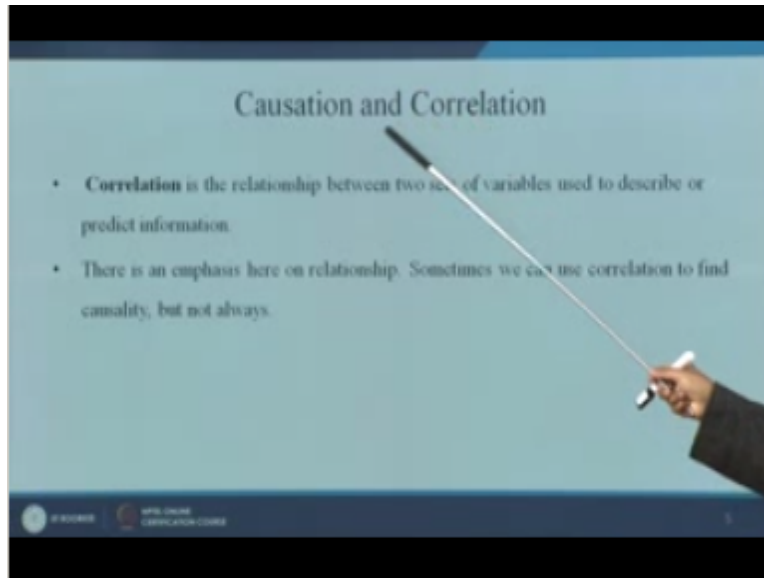
Example of Causal Research

- This research is used to measure what impact a specific change will have on existing norms and allows market researchers to predict hypothetical scenarios upon which a company can base its business plan.
- *For example, if a clothing company currently sells blue denim jeans, causal research can measure the impact of the change in the product design to the colour white for the company*
- Following the research, company bosses will be able to decide whether changing the colour of the jeans to white would be profitable.

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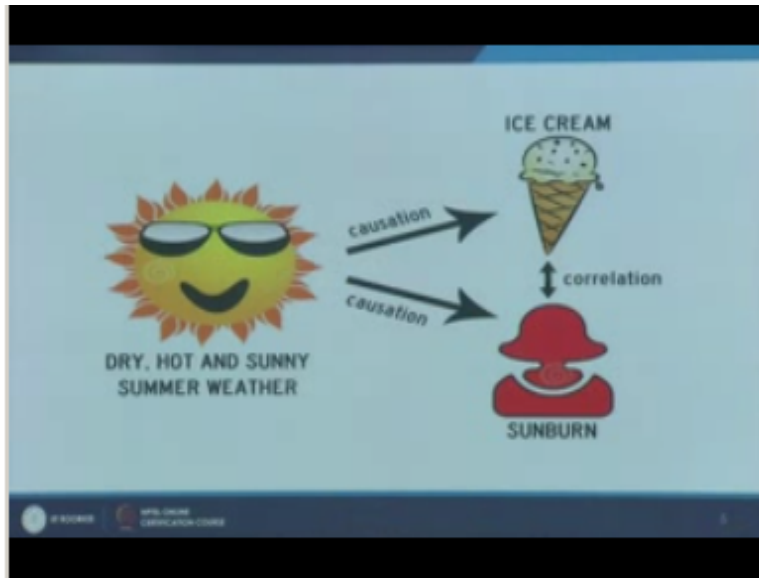
It currently sells blue denim jeans okay now it wants to know suppose it would change the color to white what will happen right so to understand this company boss will be able to decide whether changing the color of the jeans to white would it be profitable or would it have an adverse effect on the inter sales so that means the change in color will it also have an effect so this is basically what marketers want to know key if I change the design of the product if I change the prize of the product if I increase the price if I decrease the price if I bring newer designs if I increase the population through some celebrity will the brand you know the profitability of the company also go with change with it right similarly there is something we have to understand between

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What is the correlation and the causation right now you must have heard about inverse relationships positive relationships negative relationships that means sometimes due to the presence of factor or growth of a factor another factor another product or another variable declines right for example increase in petrol price will lead to decline in sales of cost okay now that is inverse relationship that means if the products price increases there could be a fall but in some other cases more hard work will lead to better grade or higher you know better achievement in class that is a positive relationship that means the more you put in hard work the more hard work you put in will bring in better scores for you so this is a positive relationship so but one is to understand that causation and correlation are not the same right for example is

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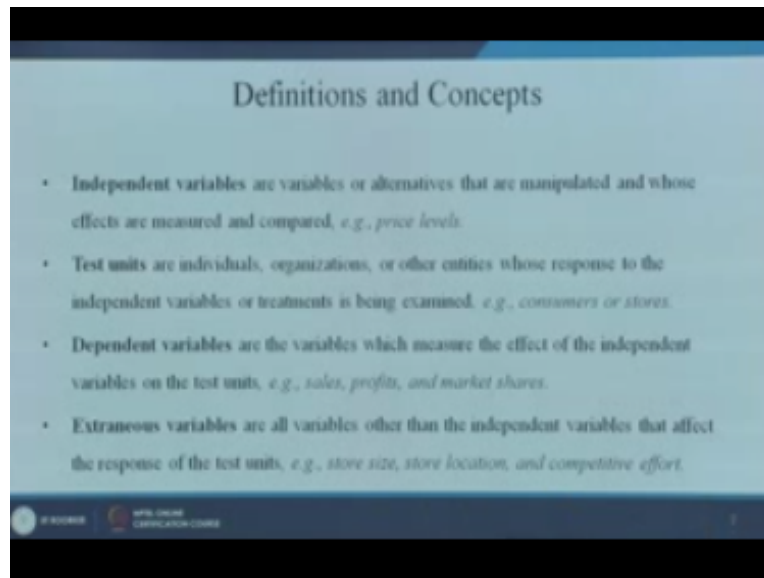


Go to this example now we know when summer increases the you know the desire for ice cream increases right more the temperature more the you know desire but for example although these 3 are very highly connected things but let us say can we say the melting of the ice-cream now it shows suppose the ice cream is melting that is a cause what is the cause behind the melting of the ice cream it is because of the temperature what is the cause behind the sun burn now there is again the temperature but do we say that sun burn.

And the ice cream are correlated how do we explain that so sometimes we need to be very clear to understand yes when temperature increases the desire to have ice cream increases the more amount of sun burn happens in your body but let us not confuse the causation and correlation right sometimes we can use correlation to find causality sometimes we can find correlation that means if two variables a and b are related that may be a cause that may behave as a cause.

But causality might not necessarily be on the reverse or the wise versa right so one is a to understand the cause and the correlation are first of all two different things right a correlation might be a cause but a cause might not necessarily be have a correlation right so that is what we were trying to show in this image right so there is a correlation is no doubt about it this correlation between temperature and you know the amount of degree of ice cream is there right but the melting of the a is cause right the sun burn is a cause right okay.

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Now let us look at some of the definitions that are used in casual design research design okay independent variables I just said right something that are manipulated here you talk about the x_1 , x_2 , x_3 that units are individuals organization whose response the independent variables or treatments is being examined for example the consumers or the store on which you are conducting the research.

Okay independent variable we said what we indenting to measure what are those extraneous variable are those variables besides the independent variables for example we like store size where is the store that means what is the location of the store or how much of the effect arte they putting on or you know into fight the competition now these are some of the variables that are basically called extensions variable they are not directly independent variables they are not directly effecting the dependent variable.

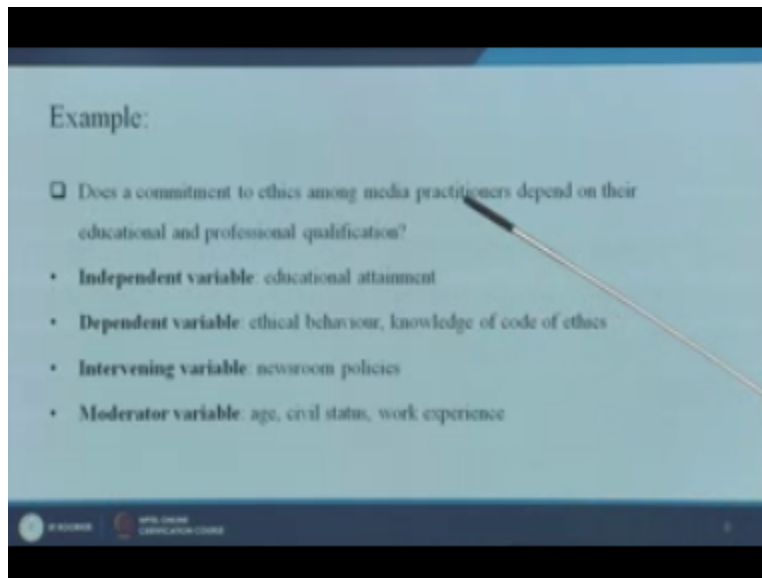
But they do still have an impact and for example let us say store size is not under a cost it is not an independent variable it is not directly effecting but it does not mean it has no effect it may still have a effect so that is although we cannot say directly it is a cause but it has an impact so that is these kinds of variables are termed and are put in the classification of extraneous variables something extra okay.

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Example:

❑ Does a commitment to ethics among media practitioners depend on their educational and professional qualification?

- **Independent variable:** educational attainment
- **Dependent variable:** ethical behaviour, knowledge of code of ethics
- **Intervening variable:** newsroom policies
- **Moderator variable:** age, civil status, work experience



Let us take this example does a commitment to ethics that means if you are most ethical among media practioners depend on their educational and professional qualification do we say that means if a person is more educated or less educated that have a effect on his ethical values now what is the independent variable here educational attainment how much of education he is got right what is the dependent variable ethical how ethical right he is or she is or the organize is what is the intervening variable are sometimes those variables which interfere.

And they change the behave like a kind of a not exactly a moderator but they bring in the change in relationship right so the policy of the company what policies do they follow that could be an intervening variable moderator variable are sometimes also there for example we say that age effect the choice of a tourist destination or a what place you want to visit is effected by your age.

So that means age moderates the more you grow in age grows you tend to become more spiritual in nature let us say that is general hypothesis okay similarly the more educated you are it is assume that the more the better the polished your behavior would be so these are the variables which are considered under the moderator variables and mostly you will find these are the demographic kind of a variables okay.

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Causal Research

Case- (Kellogg's)

Kellogg's

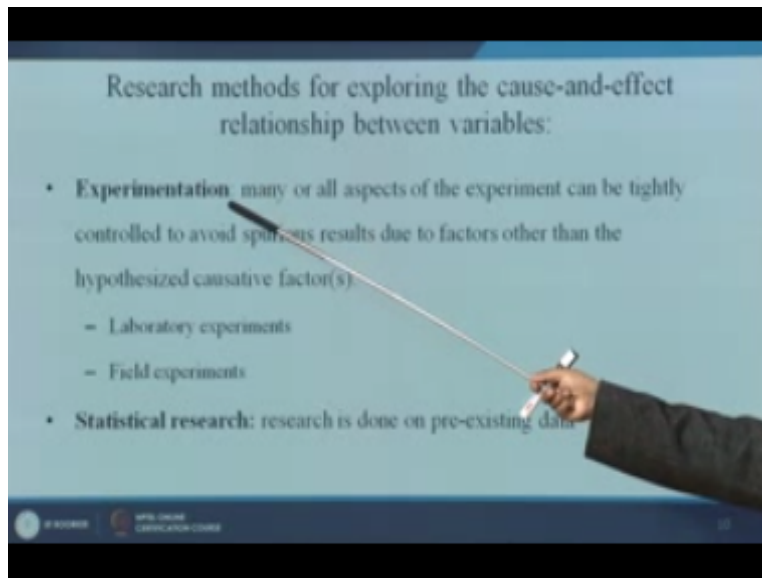
A cereal brand owner (**Kellogg Company**) wants to learn if they will receive more sales with their new cereal box design. Instead of conducting descriptive research by asking people whether they would be more likely to buy their cereal in its new box, they would set up an experiment in two separate stores. One will sell the cereal in only its original box and the other with the new box. Taking care to avoid any outside source of bias, they would then measure the difference between sales based on the cereal packaging. Did the new packaging have any effect on the cereal sales? What was that effect?

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This is the case where I think I have already associated the company wants to know if more sales would happen with the change in their packaging a new box they are introducing a new box now what they have done is the same time of the content is kept in both the boxes the old and the new box and then they want to test if whether we use the new box and the old box in the change in design is the sales being different so to test that when they did it the company took at to award any outside source of bias.

So other bias are tried to avoid and then the differences between the sales is marked so the answer could becoming then is did the new packaging have any effect on the serial says and if it what was the effect it could increase it could decrease so we can say keep packaging also tomorrow we can say that the hypothesis packaging does have a effect on the sales and then it is a positive or negative it depends right so we basically when we are talking about casual research as early as related is used with the pure science is used in mostly in the pure science it is understood more connected with the pure science for example engineering in labs and all.

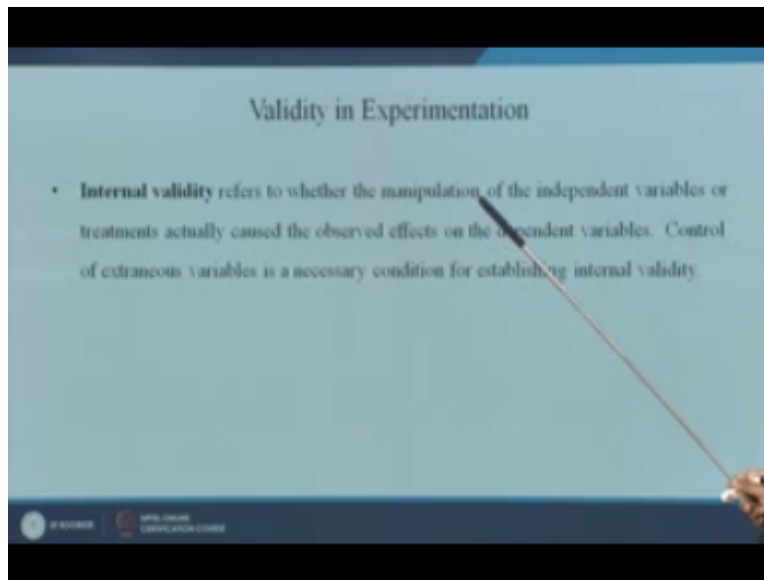
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So what I am saying here is it basically includes all the experiments so many or all aspects of the experiments can be tightly controlled to avoid spurious results due to factors other than the hypothesized causative factor so sometimes the results comes very centering results we get right and those results are just because sometimes of a lack of understanding of our independent and dependent variables right so suppose you say tomorrow that birds are flying in the sky right and let us say there was a lot of increase in sales for example.

So is there any connection between the birds flying in the air and sales no not at all so this are called furious relationships okay so when you talk about experimentation we talk about lab experiments that I just said in engineering in our chemical lab or somewhere files experiments what we do on filed for example the marketer wants to know if whether if I increase the if I change the let us say the design of the entry to the store or if I change the packaging of the of my product will it change in my effect the sales so the field experiments.

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The two words are very important as I in the class also we discussed internal validity and external validity what are the internal validity mean first of all validity the we understand then validity means that the instrument that you are using has to be justifying it is justified at doing the job what it is intended for right now what is internal validity says that manipulation of the independent variables the manipulation of this independent variables or treatments right actually caused the observed effects on the dependent variables that means what does it mean it says that if suppose you are trying to study popularity.

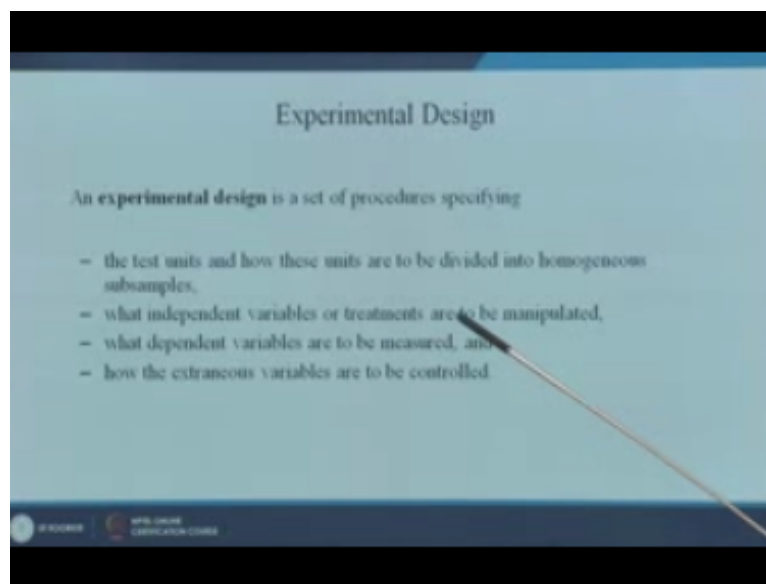
And these are the variables as you have taken then these variables are the once which are actually explaining and there are no other variables as good as that right to have an high internal validity the researcher will have to conclude or come to conclusion somewhere that the these are the independent variables which he has chosen are explaining but that is actual;llly in real in terms it does not happen because however you may conduct a study how ever good your study may be sometimes we tend to miss some important variables although we cannot take you know can escape by saying that this is part of life.

But we should try to reduce it as much as possible but whatever it is human errors will always be there you will surely miss out one or two somewhere important variables also possibly there right you might not feel their important but they might have an very important varying on the study so that is one is internal validity that means the subject that you have taken treatment that you have given actually are effecting the dependent variable second is sectional validity what

does it mean external validity means whatever study has come out or the result has come out that should be generalizable in nature now it says the cause.

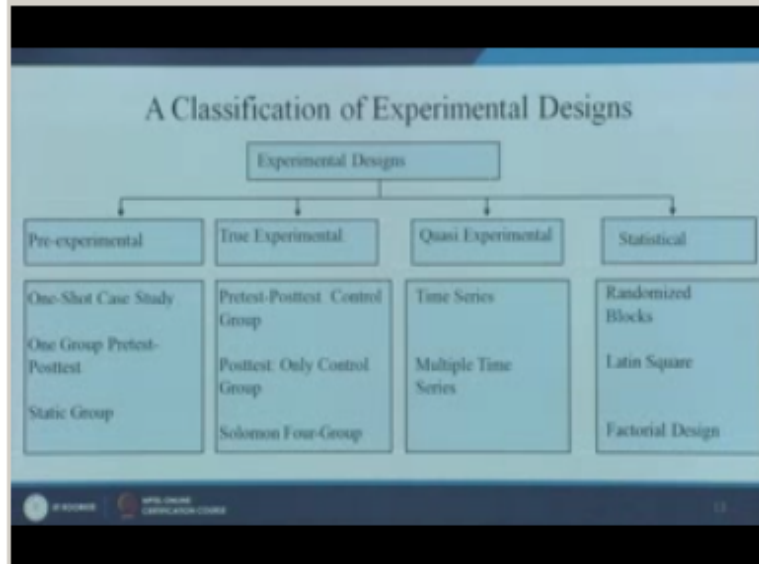
And effect relationships found in the experiments can be generalized okay to what population settings times independent variables and dependent variables can be results be projected that means what if a study does not have a generalizing ability then we would say that there is a lack of external validity so external validity means that this can be utilized or projected for all the types of you know experiments or in the future so let's see some of the experiment designs it says

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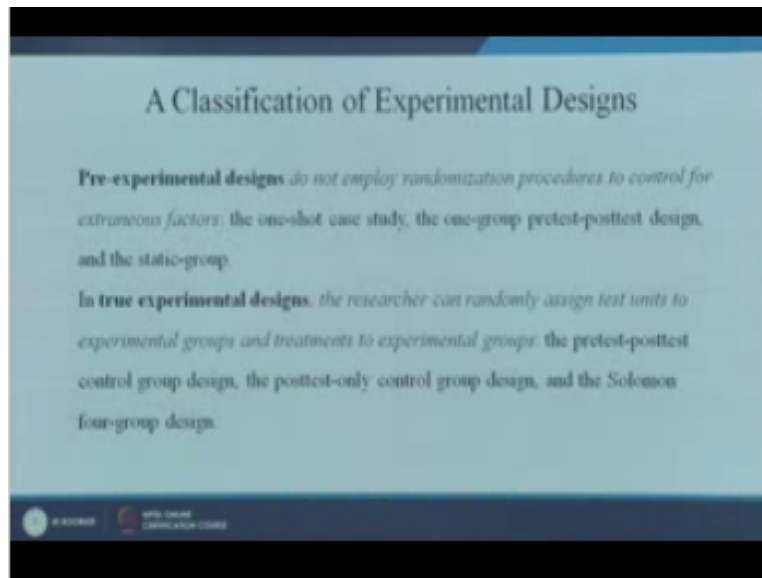
It says the test units are what we have already taken so this as this are the different you know members in the experimental design independent variables dependent variables the extraneous variables and okay.

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Now let us look at the different types so pre experimental they divided the exponential designs are divided into four categories okay pre experimental true experimental quasi experimental and statically for you benefit what I have done is I have in corporate in slides in between also I have tried to fill it in between put in between so that we do not have to remember all the things right let us go with first case this part okay.

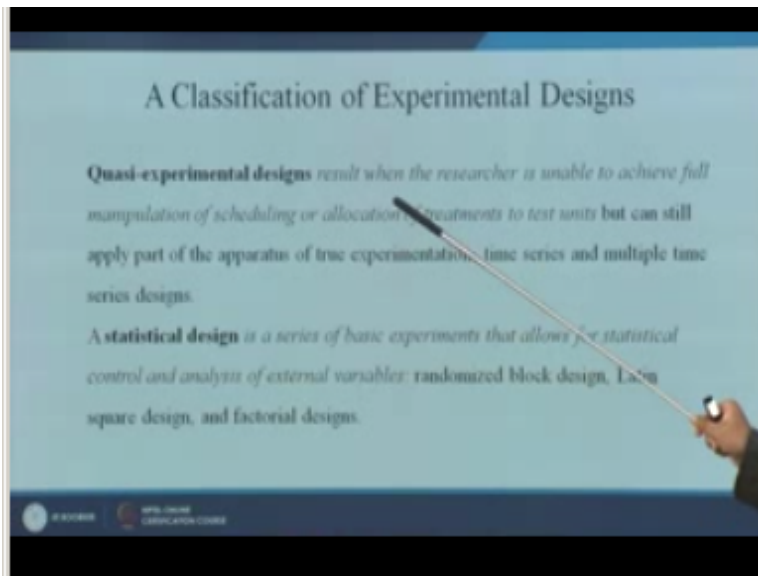
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So pre experimental designed do not employ randomization procedures now what is let say and let us understand why what is randomization is something that is randomly do something right you conduct a study on the bases of the random bases right why do we do it random bases by doing something on a random bases actually what we have done is we have been able to reduce the bias in the study suppose you do it on a judgmental bases you know what you doing then there could be a bias right you are trying to do it on a kind of public or people or somebody whom you know they would do well.

So there is already a bias so to avoid any kind of bias we use that randomization okay so the different studies are we will go to them each one of them second is the true experimental designs so the true experimental this is pre experimental the researcher is now given an ability or a scope to randomly assign the test units to the experimental groups and treatments to experimental groups that means the researcher can now randomly assign the values to the groups that are you know available to them okay by doing this what has happened but they have reduced this bias.

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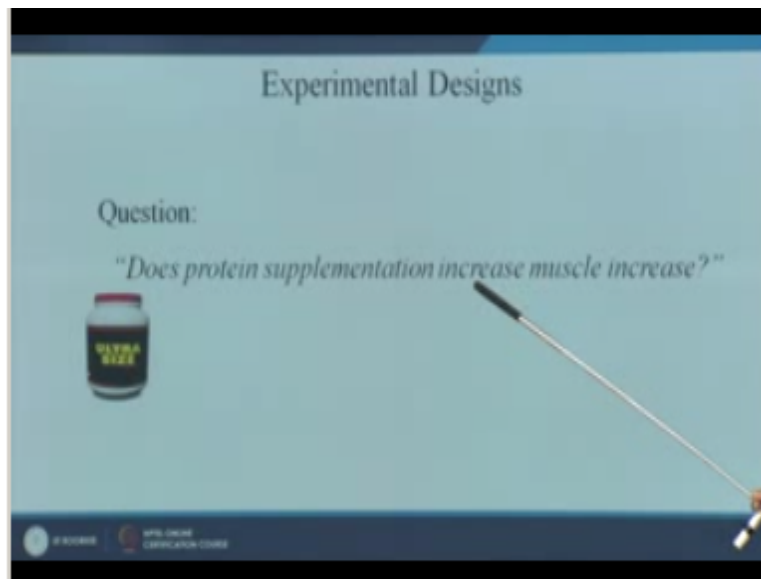
Okay causing experimental designs are the third type where the researcher is unable to achieve full manipulation of scheduling they completely cannot manipulate the situation that means complete randomization may not be possible but can still apply part of the apparatus of the true experimentation time series and multiple time series design come into that so we will get into that slowly let us not worry about it a statistical design where a basic experiments are conducted and this are the most famous once and I hope if you have gone through statics some course you have done you must be knowing about one of the most popular techniques in the analysis of variants right so what is analysis of variants and why I'm saying it.

So the analysis of variances which is a study where we are trying to study for a factor with more than two labels for example let us say when there is a factor with two or more levels there are more even number of factors that depends it is a one way of and two way and three n way right but the number of labels so suppose you have let say two levels this is sample one this is ample two this is sample three now suppose you have three levels of data right and you want to test it so in such kind of test we use the anova.

And this is the case which we also see as you have seen the names here we say this kind of a design which allows you for a randomization and which also allows you for a understanding you know study the variance in a study of a test unit we say this is called the basic anova design right so we will test you whether the sample groups are actually falling coming from the same population or not let us see.

Okay what does it have randomized block design you have basically in fact before something which is called completely randomized right and then we have randomized block Latin square design and factorial design are basically very similar expecting there is a small difference between that is Latin square design is incomplete factorial design you can say right and we will see that so let us go with an experimental design.

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I have taken this example from the net only so in case you might find some it was from universities slide if was seeing so the question was does protein supplementation increase muscle increase that is the basic question okay.

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One-Shot Case Study

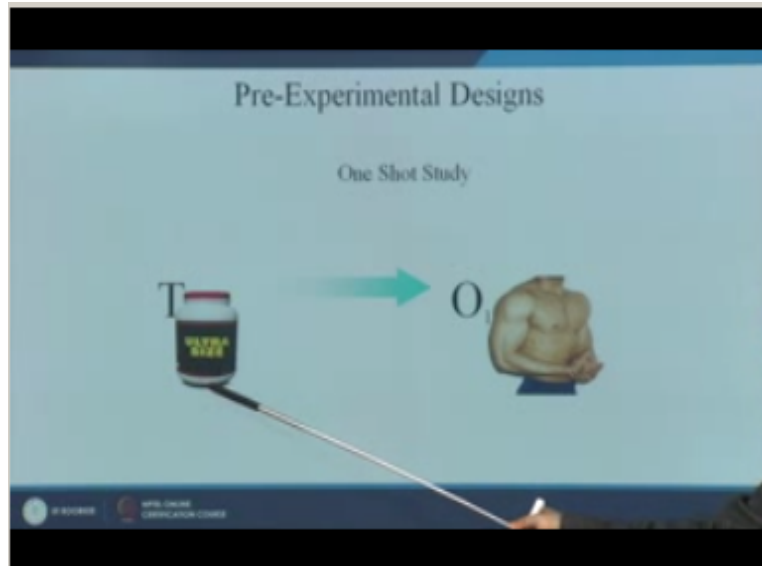
$X \quad O_1$

- A single group of test units is exposed to a treatment X .
- A single measurement on the dependent variable is taken (O_1).
- There is no random assignment of test units.
- The one-shot case study is more appropriate for exploratory than for conclusive research.

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So in one shot case study let us go back so this three one shot, one group, static okay a single group of test units here if you see now this is the treatment x is given o is the absorbed value right so a single measurement on the dependent variable is taken o_1 there is no random assignment in the one short case study right so free experimental there is no random assignment the one short case study is more appropriate for exploratory research where the researcher wants to understand in those cases this is a very this is a good way right but these having its on limitation also what is happening.

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Now this is a treatment let us say a put in powder is given and the health of the person I have shown you very good health on the health now the health has effected it might not be correct also it might having no effect then you would have not shown it is like this whatever so whatever is happening to the person right his muscle quality that we are measuring here second is one group pre test post test so there was limitation in the earlier one then there was no pre test.

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One-Group Pretest-Posttest Design

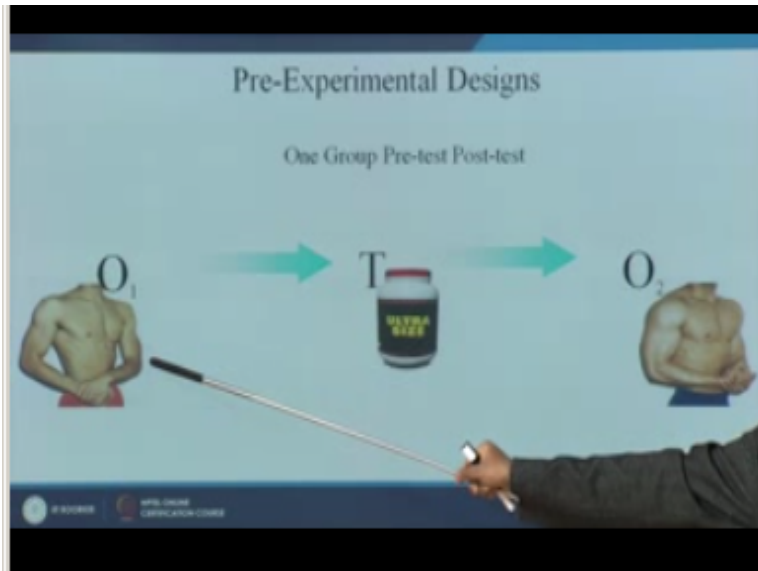
$\theta_1 \quad X \quad \theta_2$

- A group of test units is measured twice.
- There is no control group.
- The treatment effect is computed as $\theta_2 - \theta_1$.
- The validity of this conclusion is questionable since extraneous variables are largely uncontrolled.

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So now we have inter this is pre test so twice it is measured there is no control group right that is only one treatment group is there on which you will treat right like this is a sample right and the treatment is computerized $\theta_2 - \theta_1$ the validity of conclusion is questionable since extensions variables are largely uncontrolled now what does it mean please first understand then we can see this now when I'm saying let us understand from here only let us say when you are giving first the health of the person was taken.

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This is how the company is advertising the protein was given the treatment and then the health was checked again the muscle was checked again right but how can we say that it is only because of the protein it could have been also because the person has changed his sleeping habits the person has started doing something else which you are earlier you were not doing so these things are not taken here right so externally variable are not controlled here so this is the pre test post test.

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Static Group Design

EG:	X	θ_1
CG:		θ_2

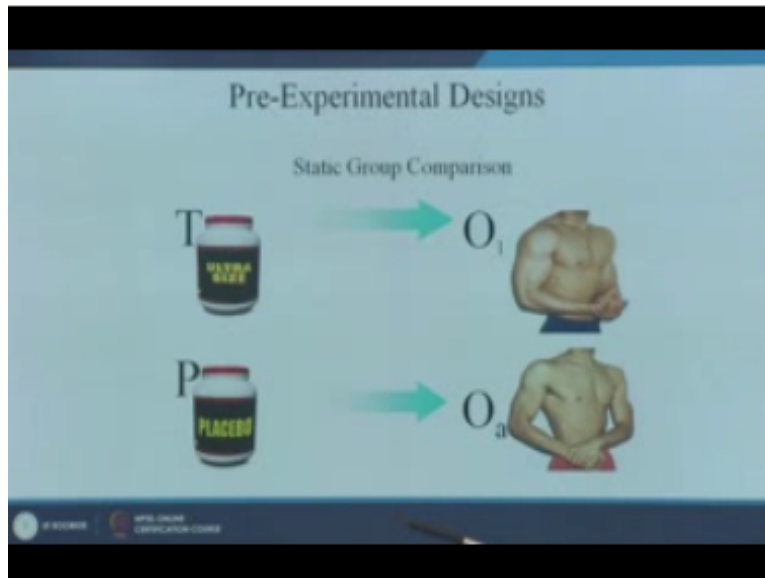
- A two-group experimental design
- The experimental group (EG) is exposed to the treatment, and the control group (CG) is not.
- Measurements on both groups are made only after the treatment.
- Test units are not assigned at random.
- The treatment effect would be measured as $\theta_1 - \theta_2$.

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The third is we say the static group design where two groups are brought in now right one was the experimental group the other is the control group now why basically we have to understand that experimental design were developed by long back by fisher okay it was basically an agriculture scientist who was actually gave us this wonderful technique of you know experimentation where he said how different blocks of agricultural fields can give outputs right.

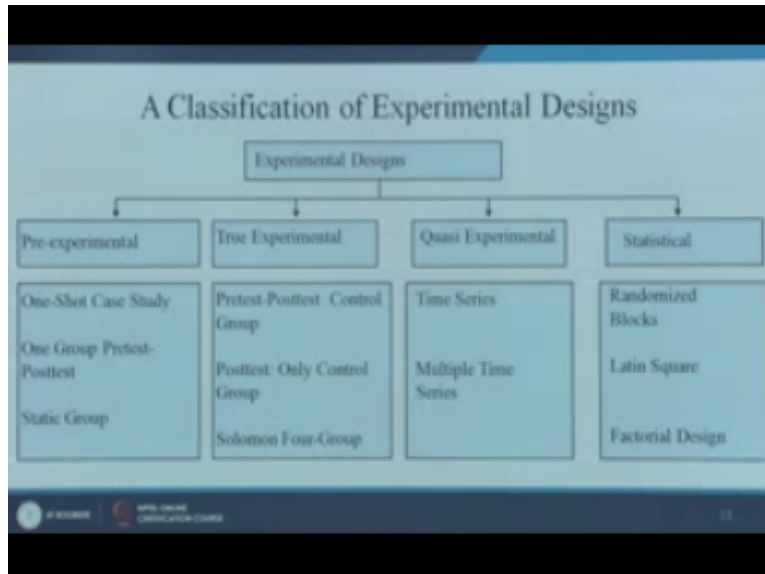
And he then introduced that let us have put the fertilizer into may be one group and the other group will keep it as it is to mark the differences right so something similarity so experimental group is exposed to the treatment control rupees not measurements on both the groups are made only after the treatment please remember so there is no pre treatment here okay.

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So let us see this treatment given group 1 place do that mean it is a does not any treatment effect that is a kind of you say it has no value nutritional value of something you can understand that way it is nothing it is a powder so which the person might feel it is there are not there so and then the change in has so if there is really differences between o and a then we will say that this effect is because of this for protein powder so that is what it does right.

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Now let us go to the next the true experimental right.

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True Experimental Designs:
Pretest-Posttest Control Group Design

EG:	R	θ_1	X	θ_2
CG:	R	θ_3		θ_4

- Test units are randomly assigned to either the experimental or the control group.
- A pretreatment measure is taken on each group.
- The treatment effect (TE) is measured as $(\theta_2 - \theta_1) - (\theta_4 - \theta_3)$
- Selection bias is eliminated by randomization.

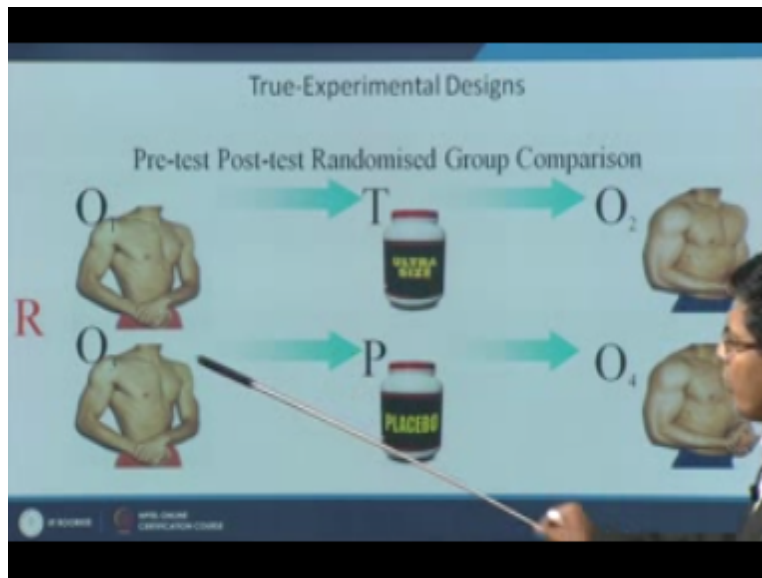


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Let the first in the true experimental is the pre test post test control group design right in this if you see what we have done test units are randomly assigned to other the experimental or the control group random earlier there was no randomization right now we have brought randomization so that means if let us say there are this is the field okay and there are four blocks it is one two three four now I earlier I can now bring in the randomization I can use fertilizer may be in this one and not this two so right.

So it I my wish or I can do this one and not these two so whatever I do right so I'm bringing in randomization so whatever I do right so I'm bringing in randomization right so a pre treatment measure is taken on each group pre treatment this is done right and the treatment effect is measured $\theta_2 - \theta_1$ let us see this.

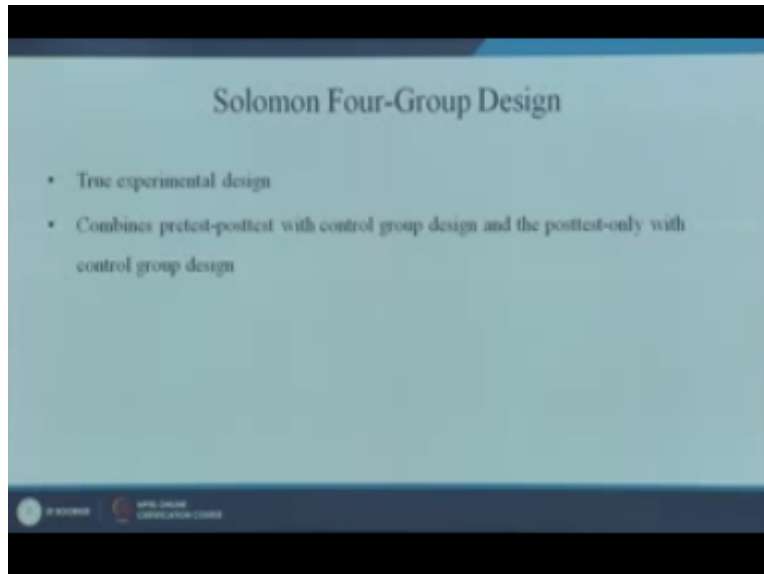
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So there is a random r is random the r stands for random right so what it has done first there was a pretest then treatment then posttest treatment pre test treatment post right but this experimentation can be done on a random bases now this is the actual protein and this is the so when we are doing this so we are able to find out exactly what is happening in this process okay post test only now that was pre test.

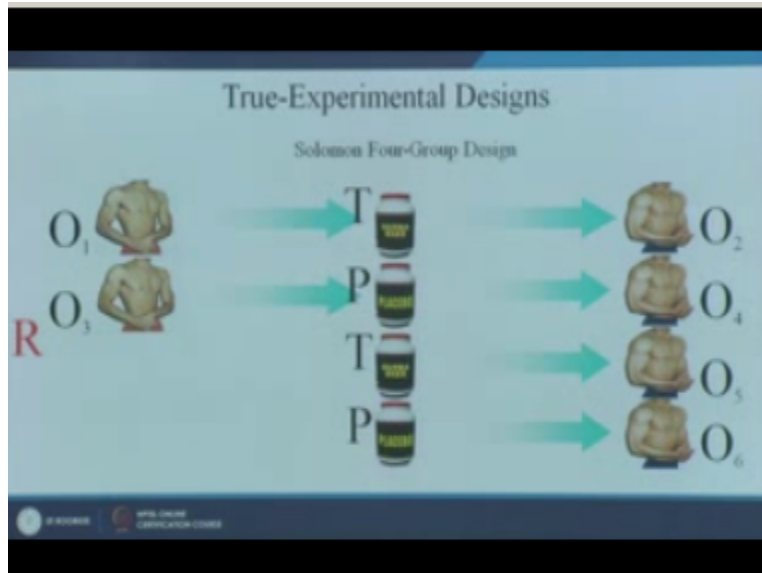
Now this is only post test we will do in the post test if you see what it is doing is let us go except for pre measurement other things remains the same expect for the pre measurement other things remains the same now there is no pre measurement random assignment is there right to which group you want to put in the random group you want to take treatment which one is at control is up to you now you have taken this two values 1 and o₂ and the differences o₂-o₁ 1-o₂ for example right okay so this is the treatment right so 01-o₂ is your decide result okay.

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This is again a concept to the true experimental design this is a four group design where lot of randomization is possible it combines pre test and post test with control group and the post test only with the control group right.

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So there are four test words basically happening here right so if you see this four test Solomon 4 group design in which o1, o2, o3, o4, o5 and o6 now these two do not have any kind of a pre test there is no pre test right but for the first two this is treatment so what has been done four basic different groups of experiments have been done in which was a treatment given and the pre test was taken and the post test was taken second there is a pre test was taken post test was taken then again a treatment was given without any pre treatment.

Now why the researcher wants to do this sometimes he wants to do this because he wants to find out first of all in these case he is trying to find out the difference okay but in this case you want to say key may be the pre test is not required right the pre test may be could have result is coming could have been possible because of some reasons unknown to us so let us take this as there is as if no pre test is allowed here and it has been the first test on this two sample groups and then the difference between theses four will exactly tell us what is the result of the or the impact of the study okay.

So well what I will do is we will continue this in the next section right in the coming section so we will finish with this how the design part and then we will move into may be if possible sampling and understand the sampling process now first let us understand the experimental design was designed to check how a treatment is given treatment means suppose a fertilizer is a treatment change in any teaching method is a treatment if you give a treatment is actually something happening to the group.

So are the result so do this we have several tests or to be say test of means right for example a tea test or a test of various showed anonova right so where we try to have some treatment groups and some control groups may be and then tried to see what is the effect at the end to the final research outcome okay thank you very much.

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