

**Marketing Research and Analysis-II (Application Oriented)**  
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**Lecture – 12**  
**Research Design - II**

Welcome friends to the class of Research Design. So in the last lecture, we had started with research design and as I said research design is a blue print or map to conduct a research. It helps you to give an idea how you should be conducting the research, so that a preplanning helps you to save your time and cost. If you are not clear with a research design, then may be, may be, why may be, there is a very large chance that you might create a messy situation for yourself and the research will take unnecessarily more time and the result might not be very sound.

So in the last lecture, we discussed about one of the types of research design which is the exploratory research design and today we will talk about the descriptive and the causal research design out of which both are together called the conclusive research design. So the first one to start with is the descriptive research.

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## Descriptive Research

- **Descriptive research** is undertaken to describe answers to questions of who, what, where, when, and how.
- It is desirable when we wish to project a study's findings to a larger population, if the study's sample is representative.
- Survey method and observational method.

So descriptive research design is undertaken, as the name suggests you can understand to describe answers to questions of who, what, where, when and how. That means who is going to use my product, what is his need, where is he present, when does he need and how does he use my product for example. So these are the 5 questions which you need to answer. So

descriptive research is a very very important part in the business research, especially in marketing research we use a lot of studies which use a descriptive research design.

So it is desirable when we wish to project a study's finding to a larger population that means what you have conducted let us say a test market in a small place and now you are trying to use this knowledge of the test market that you have done let us say in a small place in any small city or town you want to replicate the results of the test market to the larger audience of the whole country for example. So in such a condition, this is highly appropriate. So it says it is desirable when we wish to project a study's finding to a larger population if the study's sample is a representative.

Now let us say you have made a study in Delhi for example. So if you want to replicate the study in the whole of India, it might be possible, might not be, because Delhi is a metro and all the cities in India are not as good as a metro, but suppose you have done a study in a tier two city, so a tier two city there is a large possibility that the people around the country they are more closer to the tier two cities, the people in the tier two cities, their income group, their occupation, their earning abilities and all. So this is what it talks about.

So it helps you to create an external validity, project your study for the larger population. What does it consists of it consists of two methods the survey method the first one the survey method is the method where you create a survey instrument and try to take the opinion and try to measure this; and from this survey you try to come to a kind of a conclusion, you infer something; so survey methods are very very vey popular methods.

So you ask questions to the people and the answers are recorded and this may be done the survey can be done you know physically can be done online can be done telephonically so you can conduct any survey method and then the results can be properly collected and then analyzed. The second is the observational method. Now although observations seems to be very easy word and sometimes people might think what is so great about observing, but observing sometimes tells you more than what even survey cannot say.

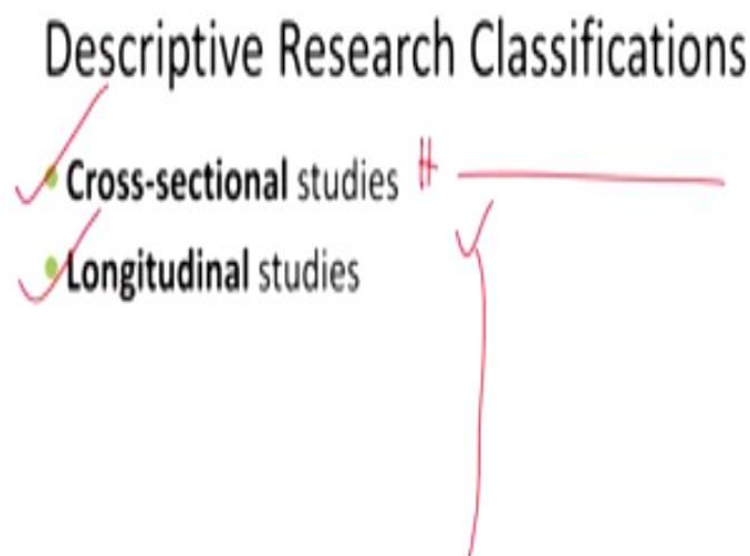
Why because when you use observational method, you are trying to observe the customer or consumer in a space where he is free and he or she is behaving very normally, but during a survey method, sometimes it is not possible because the customer or the respondent becomes

little more attentive or little more vigil and kind of a he is becoming a little more, what you say, how do you explain that, so he is becoming little more attentive you can understand that way. So in observational method, you are observing him in a space and time where he is free and behaving to his natural self.

So that is why observational methods can also be good and very useful, so you may use just an observational method through a video, through a camera, or you can use some observational method like today companies are using, researcher are using like machines and instruments to find out your palpitation rate, pupilometer, So these devices are used to measure the change in your body and then see whether these changes what do they mean.

Suppose a customer is getting a higher palpitation, does it mean that he is getting more interested for this product or service or he gets some kind of emotional changes happening in it, so what is this happening? So this sometimes very largely also used in marketing researches.

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So how do you classify the descriptive research. Now there are 2 ways of doing it, one is the cross-sectional studies and the other is the longitudinal. So cross-sectional you can understand like a horizontal study, longitudinal you can understand like a vertical study. So it is horizontal this is vertical. Now what does it mean?

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# Descriptive Research Studies

- **Cross-sectional studies** measure units from a sample of the population at only one point in time (or “snapshot”).
  - Sample surveys are cross-sectional studies whose samples are drawn in such a way as to be representative of a specific population. ✓
  - These studies are usually presented with a margin of error.

So it says cross sectional studies measure units from a sample of the population at only one point in time or a snapshot. So that means you are collecting from a set of respondents only once. So through a survey, you are collecting the respondents opinion only for once right. So this is may be at a time period of let us say 6 months or a year, so you try to collect this information. Sample surveys are cross-sectional studies, sample surveys, so some kind of sample respondents whose samples are drawn in such a way as to be representative of a specific population.

So when you are trying to study on a sample, so the sample what are the definition of sample is. The sample is defined as something that is a true representative of the population. What is it saying, a sample is part of the population that truly represents the population. So when you select sample, that means it is reflecting the population, it is representing the population. So when you are doing a survey or a study, you are doing a cross-sectional study on the sample.

Similarly cross-sectional studies are usually presented with a margin of error why, there could be a margin of error because since you are only collecting the response only one point of time, only once. So that could be a problem of response bias or a nonresponse bias. So if they are responding differently or they are not responding, so there could be a bias that can come. So that is why we say there you have to go with the margin of error, but it has its own advantages because it helps you to collect the data in a shorter period of time and make the research process more feasible and practical.

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# Descriptive Research Studies

- **Longitudinal studies** repeatedly measure the same sample units of a population over time.
- A longitudinal design differs from a cross-sectional design in that the sample or samples remain the same over time.

On the other hand, the other study is the longitudinal way. What it says is longitudinal studies repeatedly measure the same sample units of a population over time. So you are measuring the same sample units time and again that means once, twice, thrice, the same people the same respondents. A longitudinal design differs from a cross-sectional design in that the sample or samples remain the same, they do not change. Why is it done? It is done so because if you change the sample, then the entire opinion might change.

So if let us say you are talking about the performance of a product and you have asked the person for the first time, if you change that person, suppose you get a fresh person, his opinion might be completely different, but suppose we ask the same person the second time, then he would say whether the product's performance has been same over the last year, like the last year or it is different in this year. So this difference in change over the years, he can tell if the sample we are using or the same sample we are using, same respondent.

So that is why the longitudinal studies are very important and they are largely utilized in economic related studies.

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## Descriptive Research Studies

- **Continuous panels** ask panel members the same questions on each panel measurement. Fixed sample of respondents measured repeatedly.
- **Discontinuous panels** vary questions from one panel measurement to the next.
  - These are sometimes referred to as **omnibus panels** (omnibus meaning “including or covering many things or classes”).

So they are 2 types continuous panels in longitudinal studies continuous panels where panel members or the members in the panel, that means a panel is a group of members, panel members are asked the same questions on each panel measurement, so where different studies are conducted but the panel members are asked the same question again and again. So fixed sample of respondents measured repeatedly, but this is a continuous panel, but there is a discontinuous panel.

Now discontinuous panels vary questions from one panel measurement to the next. That means what it is saying, these are sometime referred to as omnibus panel in order to maximize the breadth of information, sometime the researcher is interested to ask more number of diverse questions so that the respondent can give him or her opinion. This respondents are chosen on a very systemic manner that means they are chosen with lot of seriousness, these samples are selected.

So it has been taken care of, they are not a bias sample. So when you vary this question from one panel measurement to the next, this is a case of a discontinuous panel. So what you saying is the panel members may be the same, the questions are varying now.

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## Discontinuous Panels

- **Discontinuous panels** are demographically matched to some larger entity, implying representativeness.
- Discontinuous panels represent sources of information that may be quickly accessed for a wide variety of purposes.

Discontinuous panels are demographically matched to some larger entity implying representativeness. So that means what? So we are using the panel member, they are similar to the population demographic characteristics. Discontinuous panels represent sources of information that may be quickly accessed for a wide variety. Sometime as I said, you need a breadth of questions and a wide variety of questions and their answers. In order to meet those questions and answers, may be you have selected your audience well and then you want to keep them and you want to just change in the questions. So that is where the discontinuous panels comes into play.

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## Continuous Panels

- **Brand-switching studies**: studies examining how many consumers switched brands
- **Market-tracking studies**: those that measure some variable(s) of interest—such as market share or unit sales—over time

Now example of a continuous panel. So you have understood the continuous panel, so the same members. Studies examining, this is the case of a brand switching study. So do people change their brand or are they loyal to the brand. So this study can be done through a

continuous panel method. So studies examining how many consumers switched the brands. Sometimes if you look at the numbers, the numbers might not tell you exactly but if you see if the total number might be same but if the change in the brand has happened and within the brand.

The total number of people are the same let us say, but there has been a change within the brand, that means they have moved from one brand to the other, but the total remains the same let us say. So in that condition, a brand switching study helps to understand why people have switched the brand and what is the reason behind it. Similarly market tracking studies those that measure variables of interests such as market share or unit sales over time so in such a condition, the continuous panel studies are used, where go back and see (see slide).

What is it saying, so the continuous panel, the same panel members are asked the questions on each panel measurement, same panel members. So this is what we discussed about the descriptive research. So we have understood the research design. We started with exploratory research design, then we understood what are the types of methods in the exploratory research design, then we understood what is a conclusive research design.

Within the conclusive research design what are the types of conclusive research design and among these we have 2 type of research design, one is the descriptive research design and the descriptive research design is used to understand things like who, what, when, where, how, etc and it describes the market characteristics, that is a part of the conclusive, but there is one more and research design which is very very important.

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## **Experimentation**

Causal

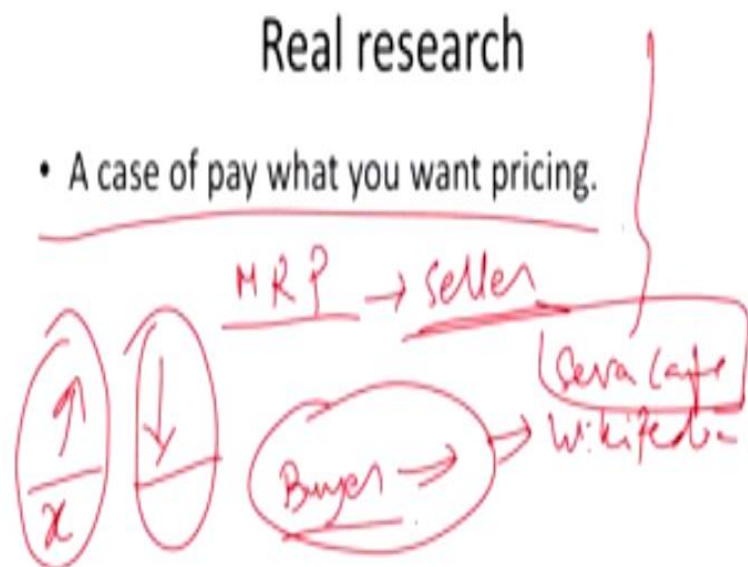
So what is this? This research design is called the experimentation or we say the causal research. The causal research design is largely and largely considered to be a experimentation



case, that means you are experimenting, may be it is a lab or it is with the people or anything, so experimenting. So there is a possible cause and effect relationship. So what is this experimentation.

We all have heard of experimentation since our childhood, we have been doing experiment in the chemistry lab, we have done some biological experiments, we have done experiments in the physics lab also. So we have done experiments. So what are these experiments and how it is applicable to the marketing research, let us see.

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So let us see case of real research. So I am starting with this case. This is the case of pay what you want pricing, this is one of the research problems which I myself involved at the moment. One of my research scholars is working on this concept of pay what you want. Now you must have heard of this, this is very interesting because you must have heard of pricing for example the MRP right, a fixed price which is set up by the seller, the manufacturer or the seller, but what if the price instead of is starts getting decided by the buyer and not the seller.

So it was a case that we have till today, we have never ever thought of that prices can be fixed by buyers. It is always always been that price has been fixed by the seller because he is the one who produces the product, but what if we take the buyer into cognizance and we understand and we allow the buyer to fix the price. What happens in such a condition? Will it work, will it not work, what will happen?

See the question is why do we have a MRP or a fixed price or a maximum retail price that because we feel that if a price is set, then the company understands well within this price, I can make this much of profit, my distribution chain can make this much of profit, the customer gets at this price, so everybody can be kept happy but suppose that means what, we are trying to fix up. So when you fix up a price, there is a there is a dual situation, one the price may be a overprice case or the price could be underprice case.

So you can never say suppose the value  $x$  that you fit in for a price, this price can sometimes be considered as an overprice case for by some consumers or it could be thought of as an undervalued price for some consumers. So if it is a overprice case, still it is a loss because consumers will feel you are cheating them. If it is underprice, then you have lost a potential of earning more and you have lost that opportunity. So the case is how do you decide.

So suppose we leave it on the buyer, then this problem of under and over price is gone, but then a new problem comes up what is this? The buyer suppose you say pay whatever you want, that means you can pay whatever you like, the consumer is free to pay whatever it likes. In such a condition, somebody would argue why would a consumer pay at all? So the question here is, that means we are coming with a hypothesis, we are moving with a hypothesis that consumers will tend to cheat and they would not pay at all.

This is a hypothesis which we have made up in our mind, but that can be grossly and grossly wrong right because some companies, some organizations have tried this process of pay what you want where they have allowed the consumers, the buyers should decide their price and they have not interfered into it and luckily the result has been not so bad but rather it has been profitable.

So for example in India, there is a hotel Seva Cafe, for even Wikipedia for that, they do not charge you anything. So how do they survive? So it survives on the buyer's interest. Sometimes the buyers donate, they pay something. Suppose something like the Seva cafe right. So what is this, it is the concept is that you go and you consume the product and you pay a price that you feel like but whatever you have consumed already somebody has paid the price for it, so you are going to pay for somebody who is coming in the future to this place.

So this mechanism of having this kind of a price can be very interesting and sometimes it could be you know more profitable. Just take a case of, I am not comparing it, but I am just

giving an example. Just imagine when it comes to charity or donations to temples and religious institutions or even donations to organizations for needy people, sometimes I have seen and we have all seen that people are very very benevolent, they open up their heart and they donate like anything, may be the number is less, may be only 30% or 20%, but then this 20% those who pay.

They pay so high that it covers up the cost for the entire 100% and even allow the companies to make profit. So look at the temples for example in India, they are flooded with money, who has given them. So it is only this 20% people, the 90% people they go and they have food free of cost, sometimes even they are allowed to stay free of cost. So this money that is covered up is from those people's money who have donated. So this mechanism can be tested in also on the practical life in our real time life and see whether this mechanism can work or not, some companies have done it and they are doing it well.

So experimentation, so this has to be experimented. Now we are experimenting with different kinds of products. For example, we have tested with commodities, how people will react in case of commodities, how people will react in case of luxury goods, how people will react to handmade goods. So we have done some of the experiments and our results we have published in one of the journals and we have interestingly found that pay what you want can be beneficial for the seller.

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**Experimentation is commonly used to infer  
causal relationships**

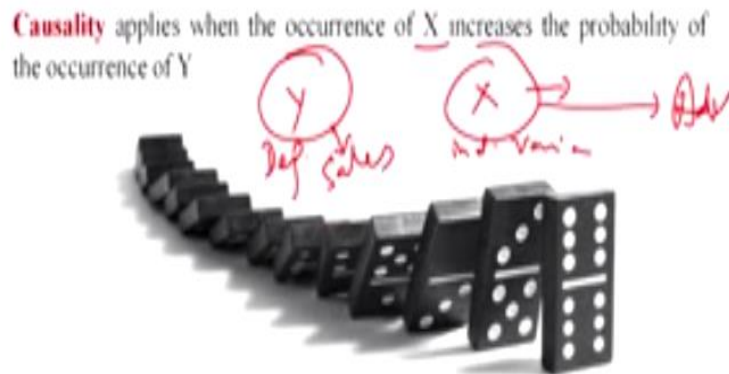


So what is this experimentation, commonly used to infer causal relationship. So look at this interesting scientist. He is so happy, so he is trying to put in some chemicals and trying to see

whether what is the result that will come. So the same thing here in the business arena or the market, we are trying to see how it will have an effect okay.

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## Concept of causality as defined in Marketing Research



The concept of causality as defined in marketing research. Now what is this causality and how it is defined in marketing research, let us see. Causality, cause and effect, applies when the occurrence of X increases the probability of the occurrence of Y, so what is my Y, Y is my dependent variable, X is my independent variable. So what we are saying here is that the presence or the occurrence of X, it increases the probability of the occurrence of Y.

If X is there then X increases, Y increases; if X increases, Y might decrease, whatever it is the presence of X will change the presence of Y. So this is what happens. Let us understand in the market for example the most classical example given is the advertisement and sales. So if my sales is my dependent variable, so the occurrence of sales is effected by the presence of advertisement. So advertisements presents in different categories or conditions will have a different effect on the sales. So this is what we talk about as causality. How do you understand.

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## Difference between the ordinary meaning and the scientific meaning of causality

Layman Ordinary meaning	Scientific Scientific meaning
X is the only cause of Y	X is only one of a number of possible causes of Y
X must always lead to Y	The occurrence of X makes the occurrence of Y more probable (X is a probabilistic cause of Y)
It is possible to prove that X is a cause of Y	We can never prove that X is a cause of Y. At best, we can infer that X is a cause of Y

This is something like the layman term and this is the scientific. So for the layman, he says X is the only cause of Y. For a layman or a general person Y is caused by X, but scientifically we cannot say that. A scientist would say X is only one of the number of possible causes of Y because we cannot be 100% sure that we have found out all the possible causes. So we will say X is only one such possible cause of Y okay. Second X must always lead to Y, so X must always lead to Y, but scientifically when we say what we say, the occurrence of X makes the occurrence of Y more probable.

So the probability increases X, we cannot say always to lead to Y, but we say the probability of this happening is more, it increases. Third it is possible to prove that X is a cause of Y, Y is the dependent X is the independent. In fact, the scientific community will realize that we can never prove that X is a cause of Y, at best we can infer that X is a cause, we can only infer, I say that I infer that X might be the cause of Y, but I cannot say I cannot prove that X is only the cause of Y, it is very very difficult all the time to prove.

Yes, you can say that but always all the time you cannot prove it. What is the condition for the cause and effect studies?

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## Conditions for causality



Before making causal inferences, or assuming causality, three conditions must be satisfied:

- 1 Concomitant variation,
- 2 Time order of occurrence of variables, and
- 3 Elimination of other possible causal factors

*These conditions are necessary but not sufficient to demonstrate causality.*

Before making a causal inference or assuming causality, 3 conditions must be satisfied. The 3 conditions, today I will explain these 3 conditions and we will stop. The first is the concomitant variation, the second is time order of occurrence of variables, and the third is elimination of other possible causal factors. So what is this concomitant variation. These conditions are necessary but not sufficient to demonstrate causality, they are necessary but not sufficient so what are these 3.

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## Concomitant variation

- A condition for inferring causality that requires that the extent to which a cause, X, and an effect, Y, **occur together or vary together** is predicted by the hypothesis under consideration (*e.g. sales and amount of advertisement, customer retention and service quality*)
- Evidence pertaining to concomitant variation can be obtained in a qualitative or quantitative manner.

*If your car makes a funny noise when you accelerate, you might take your foot off the pedal and see whether the noise goes away. (qualitative)*

So concomitant variation, I will just brief you. A condition for inferring causality that requires that extent to which a cause X and an effect Y occur together or vary together is predicted by the hypothesis under consideration. So do not worry, just look at the example. What is it saying? Sales and amount of advertisement, so I just said, what it says, a condition

for inferring causality that requires that the extent to which a cause X and Y occur together or vary together, that means they both vary together.

So if this varies, automatically this also varies, it is like a seesaw. Similarly customer attention and service quality. If my service quality is good, my customer retention may be high. If my customer service quality is poor, my retention may be low. So evidence pertaining to concomitant variation can be obtained in a qualitative or quantitative manner. Now look at this case. Suppose your car is making some funny noise when you are putting on acceleration.

So you might take your foot off the pedal, so when you accelerated, what happened there is a funny noise coming, so you took out your foot and try to see whether the noise is staying or is going away. So this is the qualitative way of understanding how are they varying together, that means with the speed, acceleration, is the noise also increasing or it is going down, it is a qualitative way of understanding.

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Consider a random survey of 1000 respondents regarding purchase of fashion clothing from department stores.

Survey data is presented in the table.

- Respondents have been classified into high-and-low-education groups based on a median or even split
- Table below suggests that the purchase of fashion clothing is influenced by education level.
- Respondents with high education are likely to purchase more fashion clothing. 73 percent of the respondents with high education have a high purchase level, whereas only 64 percent of those with low education have a high purchase level.

Consider a random sample of 1000 respondents regarding purchase of fashion clothing from department stores. So there are 1000 respondents and their interest for fashion clothing is given to you. Respondents have been classified into high and low education groups, high and low education groups based on a median value. The table below, I will show you.

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**Table presenting evidence of concomitant variation between purchase of fashion clothing and education**

**Purchase of Fashion Clothing -Y**

		High	Low	Total
Education, X	High	363 (73%)	137 (27%)	500 (100%)
	Low	322 (64%)	178 (36%)	500 (100%)

This one suggests that the purchase of fashion clothing is influenced by education level. The purchase of fashionable clothing not ordinary clothing is influenced by the education level, possible. So respondents with high education are more likely to purchase more fashion clothing. Now look at look at this, education is high, education is low, purchase is high, purchase is low. So high education and high purchase 73%, high education and low purchase of fashion clothing is only 27%.

So that means we can say that if my education level is high, my purchase of fashion clothing is high. Education is low and purchasing is high a 64%, but that is not this contradictory. So what do we understand from here.

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Based on this evidence, can we conclude that high education causes a high purchasing of fashion clothing?

**Certainly not! All that can be said is that association makes the hypothesis more tenable; it does not prove it.**

What about the effect of other possible causal factors such as income? Fashion clothing can be expensive, so people with higher incomes may be more able to afford them.

- It is possible that considering a third variable will crystallize an association that was originally obscure. The time order of the occurrence of variables provides additional insights into causality.



So you see what you can understand is this. So based on this evidence can we conclude that high education causes a high purchase of fashion clothing was the question, no, not at all. All that can be said is that association makes the hypothesis more tenable, it does not prove it, why because although it is showing that with education your fashion clothing buying is increasing, but it may be possible that the other possible factors could be income for example.

Fashion clothing can be expensive, so people with higher incomes may be more able to afford them and higher incomes are generally associated with higher education level, so it is possible that considering a third variable will crystallize an association that was originally obscure, the time order of the occurrence of variables provide additional insights into causality. So you cannot say only one, so there could be some other factors which can be responsible.

Well what I will do is, I will stop the lecture here and we will go back. So may be in the next class again, we will start with this. So we have only covered the concomitant variation, the other two we will start in the next lecture and we will go into the types of experimentation and the different types of experimental designs that is possible in a a business study or a marketing research study. We will do that right. So I hope you have understood what has been discussed in this lecture. So thank you very much.