

EX-POST FACTO RESEARCH

When active independent variables are involved, an investigator can employ experimental or quasi-experimental research. When an investigation involves attribute independent variables that the researcher cannot manipulate, he or she must turn to ex post facto research. Ex post facto research is also appropriate when the variable actually could be manipulated but is not because it would be unethical or irresponsible to do so.

For example, it would not be ethical to manipulate illegal drug use or use of alcohol or cigarettes to study their effects on human subjects. To study the effect of retention on subsequent achievement, you would not want to randomly assign some children to be retained and others to be promoted. Also, you would not manipulate the use of a drug such as Ritalin to study its effects on children's problem-solving behavior. In such cases, a researcher could use ex post facto research to compare the subsequent achievement of students who have been retained with the academic achievement of otherwise equivalent students who have been promoted or to compare the problem-solving behavior of a group of children already taking Ritalin with that of a matched group not taking the drug.

The designation ex post facto, from Latin for "after the fact," indicates that ex post facto research is conducted after variation in the variable of interest has already been determined in the natural course of events. This method is sometimes called causal comparative because its purpose is to investigate cause-and-effect relationships between independent and dependent variables. Researchers use it in situations that do not permit the randomization and manipulation of variables characteristic of experimental research. Thus, much of the basic rationale for experimental and ex post facto is the same. They both investigate relationships among variables and test hypotheses.

In an ex post facto investigation, the researcher cannot control the independent variables by manipulation or by randomization: Changes in the variables have already taken place. Because of this lack of control, in an ex post facto study it is more hazardous to infer a genuine relationship between X and Y.

Ex post facto research, unlike experimental research, does not provide the safeguards that are necessary for making strong inferences about causal relationships. Mistakenly attributing causation based on a relationship between two variables is called the **post hoc fallacy**. An investigator who finds a relationship between the variables in an ex post facto study has secured evidence only of some concomitant variation. Because the investigator has not controlled X or other possible variables that may have determined Y, there is less basis for inferring a causal relationship between X and Y.

Kerlinger (1970) has defined ex post facto research as that in which the independent variable or variables have already occurred and in which the researcher starts with the observation of a dependent variable or variables. The researcher then studies the independent variable or variables in retrospect for their possible relationship to, and effects on, the dependent variable or variables. The researcher is thus examining retrospectively the effects of a naturally occurring event on a subsequent outcome with a view to establishing a causal link between them. Some instances of ex post facto designs correspond to experimental research in reverse, for instead of taking groups that

are equivalent and subjecting them to different treatments so as to bring about differences in the dependent variables to be measured, an ex post facto experiment begins with groups that are already different in some respect and searches in retrospect for the factor that brought about the difference.

Designs

Two kinds of design may be identified in ex post facto research – the co-relational study and the criterion group study. The former is sometimes termed ‘causal research’ and the latter, ‘causal-comparative research’.

a. Co-relational (or causal) study Design

A co-relational (or causal) study is concerned with identifying the antecedents of a present condition. As its name suggests, it involves the collection of two sets of data, one of which will be retrospective, with a view to determining the relationship between them.

b. Criterion-group (or causal-comparative) study Design

In the criterion-group (or causal-comparative) approach, the investigator sets out to discover possible causes for a phenomenon being studied, by comparing the subjects in which the variable is present with similar subjects in whom it is absent. Criterion-group or causal-comparative studies may be seen as bridging the gap between descriptive research methods on the one hand and true experimental research on the other.

Characteristics

Based on the concept of the ex-post factor research, it is also known as ‘causal comparative research’. The ex-post facto research has certain characteristic which distinguishes it from other different types of researches. Some of these characteristics are presented below in the following paragraphs.

a. The research has a control or a comparison group

As the research is done on basis of the study of the cause which has already led to its effects, it becomes necessary for the researcher to keep a control group, which can be used for comparison with the actual experimental group later on, in order to analyze the cause of an already occurred event.

b. The behaviour, action, event or the treatment or the independent variable of the research cannot be manipulated or changed

As the ex-post research is a kind of study which tries to predict the causes on the basis of actions that have already occurred, the researcher cannot manipulate or change the already occurred actions or behaviour.

c. The research focuses on the effects

Since the researcher tries to analyze and predict the reasons behind the occurrence of an event or phenomena, their first attempt is to focus on the event or the phenomena that has already occurred.

Only after having a detailed study of the phenomena or the event, the researcher tries to determine the causes behind such an event or phenomena.

d. The research tries to analyze the ‘how’ and ‘what’ aspect of an event

Since the researcher tries to understand the causal effects behind a phenomena, the research basically focuses on how and what reasons that has led that phenomena to occur.

e. Explores possible effects and causes

With the help of an ex-post facto research, the researcher tries to analyze the cause and effect phenomena of an event, action or behaviour.

Differences between an Ex-post facto and Experimental research

There is no doubt that both the experimental research and the ex-post facto research try to investigate relationships between the existing variables, the conclusions of both are logically as well as empirically valid and reliable, yet there are certain basic differences between both of them. They can be pointed out as follows:

	Ex-post Facto Research	Experimental Research
Control over independent Variable	In an ex-post facto research, the researcher cannot directly manipulate the independent variable/s (that is, the cause) as he or she predicts the cause on basis of the dependent variable (i.e., the effect).	In an experimental research, the researcher can directly manipulate the independent variable/s (that is, the cause) in order to examine its effect on the dependent variable (that is, the effect).
Principle of Randomization	The researcher cannot use the principle of randomization in an ex-post facto research as the researcher has no direct control over the cause and so they infer the possibilities of the causes on basis of the existing effect.	The researcher can use the principle of randomization in an experimental research on basis of which they can conclude or infer that other things remaining equal/ constant/controlled the effect is a result of manipulation of the cause.
Manipulation of variables	The researcher cannot manipulate variables in an ex-post facto research.	The researcher can manipulate variables in an experimental research
Interpretation	It is difficult to interpret or infer relationship between the independent and dependent variables as there can be more than one possibilities or cause for a particular effect.	It is easier to interpret or infer relationships between the independent and dependent variables as they can manipulate the independent variable and see its effect on dependent variable

Essentials/ Requisites for inferring causal relationships

In order to infer or conclude the cause and effect relationships, the researcher needs to take care of the following aspects:

(i) Associative variation

In order to infer/ predict or conclude that a particular effect 'y' is a result of a cause 'x', there should be an association between them. Therefore, the researcher can come to a conclusion only after examining that a variation in 'x' yields the effect 'y'.

(ii) Systematic order of events

The events or the process follows a consistent sequence or order. If variable 'x' causes 'y', then variable 'x' must occur before or simultaneously with 'y', and not after it.

(iii) Absence of other causes

The researcher should analyze each aspect of the causal relationship with full detail and find out the best possible cause/ reason or independent variable that has ultimately led to the effect /action or event to occur. For example, the etiology of cancer can be due to several factors. In an ex-post facto research, the researcher finds out the best possible reason that might have led to the occurrence of that disease within the person or the subject.

Steps of ex-post facto research

The process of ex-post facto research is systematic and follows a definite sequence. As mentioned by Isaac and Michael (1971), the following are the steps involved in the ex-post facto research—

1. Determining the problem

In an ex-post facto research, it is necessary for the researcher to focus on the problem that he or she needs to study. They not only need to find out a problem, they also need to determine, analyze and define the problem which they will be dealing with.

2. Literature Review

Before trying to predict the causal relationships, the researcher needs to study all the related or similar literature and relevant studies, which may help in further analysis, prediction and conclusion of the causal relationship between the variables under study.

3. Formulation of hypothesis

The third step of the ex-post facto research is to propose the possible solutions or alternatives that might have led to the effect. They need to list out the assumptions which will be the basis of the hypothesis and procedure of the research.

4. Designing the approach

Once the problem has been defined and the hypothesis has been postulated, the researcher needs to select the sample which fits the criteria of the study. They also need to select the scale or construct

instrument for collecting the required information / data. Once the designing are all finalized, the researcher analyses the relationship between the variables.

5. Validity of the research

The researcher needs to validate the significance of their research. They need to be cautious regarding the extent to which their findings would be valid and significant and helpful in interpreting and drawing inferences from the obtained results.

6. Interpretation of the conclusion

Finally, the researcher needs to analyze, evaluate and interpret the information collected. It is on basis of this step only; the researcher selects the best possible alternative of causes which might have led the effect to occur.

Similarly, **Jacobs et al.** (1992: 81) also proposed that the following steps are involved in conducting an ex-post facto-research:

1st Step: The first step should be to state the problem.

2nd Step: Following this is the determination of the group to be investigated. Two groups of the population that differ with regard to the variable should be selected in a proportional manner for the test sample.

3rd Step: The next step refers to the process of collection of data. Techniques like questionnaires, interviews, literature search etc. are used to collect the relevant information.

4th Step: The last step is the interpretation of the findings and the results. Based on the conclusions the hypothesis is either accepted or rejected.

It must be remembered that even though the ex-post facto research is a valid method for collecting information regarding an event that had already occurred, this type of research has shortcomings, and that only partial control is possible.

Strengths and Weaknesses of Ex-post Facto research

Followings are the Strengths and Weaknesses of Ex-post Facto Research

Strengths

1. It is considered as a very relevant method in those behavioural researches where the variables cannot be manipulated or altered.
2. The examples of such researches can include many sociological (e.g. delinquency) as well as educational variables (e.g. achievements).
3. It is more useful than an experimental research as it can be used in analyzing a cause on basis of the effect, which is impossible in an experimental research.
4. It is less time consuming as well as economical.
5. It gives a chance to the researcher to analyze on basis of his personal opinion and then come out with the best possible conclusion.

Weaknesses

1. The researcher cannot manipulate the independent variables.
2. The researcher cannot randomly assign the subjects to different groups.
3. The researcher may not be able to provide a reasonable explanation for the relationship between the independent and dependent variables under study.

Suggested Reading

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