

## Comparison between Field Research and Controlled Laboratory Research

**Hassan A. Aziz**

Academic Affairs College of Arts and Sciences, Qatar University, P.O. Box: 2713 Doha, Qatar

\***Corresponding Author:** Hassan A. Aziz, Academic Affairs College of Arts and Sciences, Qatar University, P.O. Box: 2713 Doha, Qatar, Tel: 00974-4403-4783; E-mail: [hassan.aziz@qu.edu.qa](mailto:hassan.aziz@qu.edu.qa)

**Received:** 15 April 2017; **Accepted:** 24 April 2017; **Published:** 28 April 2017

### Abstract

Research is defined as the systematic inquiry in order to reach new conclusions or to confirm earlier findings. The research design plays a critical role in the validity of the collected data and its analysis and thus, the main findings of the research problem. This review article compares between two research designs; field research and controlled laboratory research. Whilst field research offers contextual data on settings, interactions, or individuals, controlled laboratory research is basic, repeatable, and efficient type of research that can be applied across a variety of disciplines.

**Keywords:** Field Research; Controlled Laboratory Research

### 1. Introduction

Research is a systematic method of inquiry that identifies the purpose of research as one of obtaining information pertaining to some question or set of questions. There is a variety of ways to obtain answers. The approach selected depends on several factors, including the nature of the question, the setting in which the research is to be conducted, and the background and the disciplinary orientation of the researcher [1]. While basic research aims to discover fundamental principles of human behavior, applied research is undertaken with specific practical problems in mind. Both basic and applied research can take place either in a field setting or in a controlled laboratory setting.

The distinction hinges on whether the study occurs inside or outside the laboratory [2]. The purpose of both designs is to develop an experiment that will solve the research question and to minimize "contamination" of the results by extraneous factors [3].

## **2. Field Research vs. Controlled Laboratory Research**

Field research is a research conducted in the real world or a natural setting. It tends to observe, analyze, and describe what exists rather than manipulating a factor under study [4]. The research settings resemble the situations encountered in daily living, preserving the naturalness of the setting. Participants in a field research may or may not know that they are being studied. On the other hand, controlled laboratory research is a research conducted in a setting specifically designed for research. Laboratory research is often described as tightly controlled investigation in which the researcher manipulates the particular factor under study to determine if such manipulation generates a change in the subjects [5]. The subjects in laboratory research can be selected and placed in conditions more systematically and they usually know that they are participating in a research study.

The factor under study, known as the experimental variable or the independent variable, is the variable that a researcher manipulates [6]. The measure of change is known as the criterion measure. It is also called the dependent variable since the change is presumably dependent on the researcher's manipulation of the experimental variable.

Field research studies are more likely to be descriptive, developmental, correlational, and survey in design than they are to be experimental. The principal advantage of field research is its generalizability to real-life contexts because they represent a greater variety of situations and environments that subjects experience in their natural habitat [7]. Note that this advantage can be misleading, the lack of control and the impossibility of precisely characterizing the field environment may make it very difficult to judge the generalizability of the study. Sometimes, the code of ethics would have an impact on the decision on where to locate the study [8]. Researchers often prefer the laboratory design to the field because of problems with informed consent and privacy of the participants.

Due to the greater control that researchers are generally able to exert in a laboratory setting than in a naturalistic setting, laboratory research studies are more likely to represent a true experimental design. Laboratory studies have the advantage of greater control of irrelevant variables that might otherwise influence the results and thus of clearer clues of the behavior being observed [9]. If controlling all extraneous influences is successfully accomplished, any change observed in the subjects is presumed to be caused by the variable that has been manipulated. This approach comes close to establishing a cause-and-effect relationship. Nevertheless, caution should be taken when considering such a relationship. There are always the possibilities that there were an uncontrolled outside influence and the likelihood that the results were caused by chance. Another advantage of laboratory research is its reproducibility [10]. The environmental conditions can be neatly controlled and documented. Like any other research method, disadvantages can be encountered in laboratory research. It may represent an artificial environment that may influence the manner in which subjects behave and therefore alter results.

### 3. Validity of Research

Any uncontrolled extraneous variables affecting performance on the dependent variable are threats to the validity of an experiment, whether it is conducted in a field setting or a controlled laboratory setting. An experiment is valid if results obtained are due only to the manipulated independent variable and if they are generalizable to situations outside of the experimental setting. Those two conditions are referred to as internal validity and external validity [1]. Internal validity refers to the condition that observed differences on the dependent variable are a direct result of manipulation of the independent variable [3]. External validity, on the other hand, refers to the condition that results are generalizable to environments outside the experimental setting [3]. Maximizing the internal validity requires very rigid control in a laboratory setting, which in turn makes the research less realistic to non-laboratory setting. Meanwhile, the more natural the experimental setting becomes, the more difficult it becomes to control extraneous variables [5].

Researchers usually compromise for an environment somewhere between a controlled laboratory setting and a natural setting. This permits the researcher to exercise sufficient control to ensure adequate internal validity while maintaining a degree of realism necessary for generalizability.

### Conclusion

The most fruitful overall research approach is usually to use both, laboratory and field research. The results of controlled experiments produce new approaches or hypotheses to be tried and investigated in the field. Conversely, observations in the field produce new hypotheses to be tested by controlled experiments.

### References

1. Farrugia P, Petrisor B, Farrokhyar F and Bhandari M. Research questions, hypotheses and objectives. *Can J Surg* 53 (2010): 278-281.
2. Hanson BP. Designing, conducting and reporting clinical research. A step by step approach. *Injury* 37 (2006):583-594.
3. Guyatt G, Rennie D. User's guide to medical research: a manual for evidence-based clinical practice. 3rd ed. Chicago (IL): AMA Press Printing 2002.
4. Haynes BR. Forming research questions. *J Clin Epidemiol* 59 (2006): 881–886.
5. Hulley S, Cummings S, Browner W, et al. Designing clinical research. 3rd ed. Philadelphia (PA): Lippincott Williams and Wilkins 2007
6. Sackett D, Strauss S, Richardson W, et al. Evidence-based medicine: how to practice and teach evidence-based medicine. 2nd ed. Edinburgh (UK): Churchill Livingstone 2000.
7. Fisher CG, Wood KB. Introduction to and techniques of evidence-based medicine. *Spine* 2007;32 (Suppl): S66-S72.
8. Freedman B. Equipoise and the ethics of clinical research. *N Engl J Med* 317 (1987): 141-145.
9. Bland JM, Altman DG. One and two sided tests of significance. *BMJ* 309 (1994): 248.

10. Braga LH, Easterbrook B, Jegatheeswaran K, Lorenzo AJ. From Research Question to Conducting a Randomized Controlled Trial on Continuous Antibiotic Prophylaxis in Prenatal Hydronephrosis: A Rational Stepwise Process. *Frontiers in Pediatrics* 4 (2016): 27.



This article is an open access article distributed under the terms and conditions of the

[Creative Commons Attribution \(CC-BY\) license 4.0](https://creativecommons.org/licenses/by/4.0/)