

# The impact of religious faith on statistical use and inference

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## Abstract

Individuals with strong religious beliefs often find it difficult to accept statistics as an information gathering and decision-making tool. I present a couple of key concepts and corresponding learning activities not typically incorporated into an introductory statistics class that help students understand the co-existence of statistics and their religious beliefs.

## Introduction

I have noticed that religious organizations and people with strong religious beliefs can have difficulty accepting statistics as an information gathering and decision making tool. My experience is not an isolated case. Recently, the editor of the Journal of the Association of Christians in the Mathematical Sciences stated that “Relatively little has been done thinking through a Christian perspective on probability and statistics.”<sup>1</sup> To address this need for understanding, I present material which I have found to be helpful in addressing concerns about statistical use.

## Understanding what statistics is really doing

Statistics is merely a systematized form of inductive reasoning: a logically sound form of reasoning practiced daily by most people, which is not contradictory to Christian and other faiths.

Induction is “inference of a generalized conclusion from particular instances.”<sup>2</sup> More clearly stated, when we induce, we observe the world around us, and then draw conclusions which are based on our knowledge of how the world typically works. For example, I may observe that Jane just came in from outside and is wearing a hat and gloves. Past experience tells me that people who wear hats and gloves do so when it is cold outside. Thus, my induced conclusion is that it is cold outside. Am I right? Not necessarily, but this is the nature of induction. Three common fallacies that occur in induction are<sup>3</sup>:

1. The fallacy of hasty generalization, which occurs when you induce from insufficient information.
2. The fallacy of exclusion, which occurs when you exclude an important piece of evidence from the inductive process.
3. The fallacy of a non-representative sample, which occurs when the evidence used to make the induction does not accurately represent the group the induced conclusion is meant to apply to.

Statistics presents a systematized form of inductive reasoning, which hopes to address common pitfalls of inductive reasoning. Statistics does this by preventing one from making a hasty generalization (through an understanding of standard errors and hypothesis testing). By demonstrating when to include and exclude information (through an understanding of outliers

and confounding and lurking variables). And by knowing how to obtain a representative sample (through an understanding of random sampling techniques). These are only a few of the examples of how statistics addresses fallacies of inductive reasoning, for more see Bradley's "Two ways of knowing"<sup>4</sup>. This paper is freely available, and also contains helpful study questions for students, in fact it was written in order to "*facilitate the integration of faith and learning in an introductory, non-calculus based statistics course.*"

#### *Examining when induction and systematic quantification are used in the Bible*

In the past, individuals with a Christian faith will cite the census taken in 2 Samuel 1 (and it's concurrent account in 2 Chronicles 21) as an example of how surveys (more generally statistical observation) in religious settings are in conflict with God's will. However, examination of the text shows that this census was taken in clear disobedience of God's will. Further confirmation is seen in Numbers 1 when a census was taken by the direct order of God.

When Joshua and Caleb scouted the Promised Land in Numbers 13, 14 and when Jesus fed the 5,000 in Mark 6:38, the Bible shows that quantification of a situation is not inherently wrong. What was induced differed depending on whether or not one was in tune with God (Joshua and Caleb vs. 10 other scouts and Jesus vs. disciples). In other words, the need for statistical assessment is not inherently wrong. However, we can run into problems when we interpret that information in a way that is incongruent to the truth as God sees it.

## References

1. Journal of the Association of Christians in the Mathematical Sciences. 2004. Letter from the Editor. [www.acmsonline.org/letterfromeditor.htm](http://www.acmsonline.org/letterfromeditor.htm).
2. Merriam-Webster's Collegiate Dictionary. 10<sup>th</sup> Edition. 1993.
3. "Deductive and Inductive Arguments." <http://webpages.shepherd.edu/masutin/rhetoric/deductiv.htm>
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