

The Null Hypothesis

1. Introduction

The word hypothesis means a working statement. A hypothesis is tested to show whether it is true or false. The purpose of repeatedly testing a hypothesis with the same result as true is to confirm a larger theory. When a theory is repeatedly confirmed, then it becomes a law which is proven.

A brief history of the null hypothesis may be summarized as follows. The *via negativa* in theology describes God in negative terms by what God is not. In contrast, the *via positiva* in theology describes God in positive terms by what God is. The *via negativa* is known as apophatic theology. In contrast, the *via positiva* is known as kataphatic theology. The null hypothesis as used in modern science is based on the *via negativa*. The null hypothesis therefore traces its origin to the study of theology.

2. Method

The method is to perform an experiment to show what the null hypothesis is. This includes design of the experiment, data collection, and assumptions.

The design of the experiment is to state the null hypothesis in regard to the gender of students who take choir in middle school. Hypothesis one states that “the number of girls is greater than the number of boys”. Hypothesis null states the opposite alternative that “the number of girls is equal to or less than the number of boys”. It is important to note that the opposite of “girls greater than boys” is not exactly “girls less than boys” but also “girls equal to boys”. The design is then to test the null hypothesis by collecting data for the experiment and presenting results to show the null hypothesis is true or false.

The hypotheses may be written in this notation:

H_1 : girls $>$ boys (read as hypothesis one is “girls greater than boys”)

H_0 : girls \leq boys (read as hypothesis null is “girls less than or equal to boys”)

The data as the number of boys and girls is to be obtained from the choir teacher, and the total number of subjects is summed to show the size of the sample.

Three things are taken for granted. First is that the method is formed correctly and that the experiment follows the method. Second is that the data is accurate such as correct numbers of subjects and that the data is complete such as not leaving out any subjects. Third is that the total number of subjects is sufficiently large to be meaningful.

3. The experiment

The experiment was performed at a Middle School in Colorado Springs, CO for grades 6, 7, and 8. A teacher was the source of the data that was 30 boys and 130 girls, for a total of 160 subjects in the sample.

4. Results

The results in the notation above were this.

H_1 : girls (130) > boys (30); hypothesis one is true

H_0 : girls (130) <= boys (30); hypothesis null is false

Because there are more girls than boys, hypothesis one is true and hypothesis null is false.

5. Conclusion

This project explains the null hypothesis by defining terms, presenting background history, and building an experiment. The null hypothesis is tested with results that show the example is false.

6. Acknowledgments

Thanks are due to: North Middle School, Colorado Springs, CO; and the Tutt Library and reference librarian at Colorado College, Colorado Springs, CO.

7. Bibliographical references

Demi-Smith, Janeen (1998).

“Null hypothesis statements”. Lecture notes. March 2, 1998.

<http://www.uccs.edu/~jademism/nullhyp.html>.

Hoffman, Howard S (2000).

“Null hypothesis”. *The internet glossary of statistical terms*. The Animated Software Company. January 13, 2000.

<http://www.animatedsoftware.com/statglos/sgnullhy.htm> .

Lane, David M (1999).

“Null hypothesis”. *HyperStat Online*. Parts 1/4. September 29, 1999. Mirrored on September 13, 2000 at:

<http://www.ruf.rice.edu/~lane/hyperstat/A29337.html>
; ... /A73664.html ; ... /A72620.html ; ...
/A73079.html .

McAtee, Bret L (2000).

“Re: apophatic [theology and kataphatic theology]”. List server email. June 14, 2000.

<http://www.ccir.ed.ac.uk/~jad/vantil-list/archive-Jun-2000/msg00157.html> .

Mortley, Raoul (1982).

“The fundamentals of the via negativa”. *American Journal of Philology*. 103 (1982) 429.

University of Cambridge [Press] (1981).

“Maths thesaurus: null hypothesis”. November 19, 1981.

<http://thesaurus.maths.org/dictionary/map/word/460> .