## Generalizing Riemann: from the *L*-functions to the Birch/ Swinnerton-Dyer conjecture

David F. Haight \* Department of Philosophy Plymouth State University Plymouth, New Hampshire 03264 U.S.A.

## Abstract

To prove: that the generalized Riemann hypothesis is true, namely, that all the zeta zeros of *L*-functions are balanced on the one-half number line, using the scale of the harmonic zeta function. Now that the Riemann hypothesis has been proven (in *"Summa Characteristica* and the Riemann Hypothesis: Scaling Riemann's Mountain", *Journal of Interdisciplinary Mathematics*, Vol. 11 (6) (December 2008)), it can be extended by analytical continuation to prove the generalized hypothesis concerning *L*-functions. The initial "gene" or generating (one half) principle that proves the Riemann hypothesis also proves that no *L*-series has a zero with real part on the complex plane other than one half. As a result of this proof, the Birch/Swinnerton-Dyer conjecture is also resolved. Finally, what impact, if any, do these proofs have on security codes based upon prime numbers?

*Keywords and phrases :* Riemann hypothesis, harmonic zeta function, harmonic mean/gene, Farey/Cauchy mediant, Dirichlet L-functions, Euler's/Riemann'sproduct, non-trivial zeta zeros, Birch/Swinnerton-Dyer conjecture.

## 1. Introduction

The Riemann Hypothesis is not just a problem. It is *the* problem. It is the most important problem in pure mathematics. It's an indication of