TESTING FOR ADDITIVE GENE-ENVIRONMENT INTERACTION

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During the rapid development of molecular biology in recent years, it has become commonly recognized that human health is affected by both environmental and genetic factors, not separately but jointly, and for many diseases, the genetic influences are exceedingly complex. In etiological studies of noninfectious diseases, a natural goal is to understand how genetic makeup and exposure history work together to influence susceptibility, that is, to measure the gene-environment (G×E) interaction.

The paper suggested a generalized logistic model to detect the additive gene-environment interaction. Parameters in the model can be easily estimated by means of MLE. A serial of numerical simulation studies were performed to assess the power of testing the gene-environment interaction on the additive and multiplicative scale.