Public Abstract

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Title:Decomposing Individual and Group Differences of Categorical Variables with Genetic Factor Model

Genetic factor model have been used for studying the contributions of genetic and environmental factors on individual differences of phenotype behavior. While Dolan, Molenaar, and Boomsma (1992) suggested a model that can be used to decompose group differences of phenotype behavior with genetic and environmental factors, this model cannot be directly applied to phenotype behavior measured by ordered categorical variables. Current study suggests a model that extends the model by Dolan et al. that can be used to decompose group differences measured by ordered categorical variables by incorporating Latent Response Variable formulation. Basically, the responses on observed categorical variables are mapped onto latent continuous variables which underlie observed categorical variables and latent continuous variables are modeled with genetic factor model. Group differences of latent response variables are estimated from the differences of response proportions across groups with parameter constraints. The application of proposed method is illustrated with the data from Australian Twin Registry to model the difference of conservatism between men and women. The analysis on the data shows that one's conservative attitude consists of several sub-dimensions and genetic and environmental factors differently affect the individual and group differences of each sub-dimension of conservative attitude.