Twin Research and Human Genetics: Supplementary material

**Operating Characteristics of Statistical Methods for Detecting Gene-By- Measured Environment Interaction in the Presence of Gene-Environment Correlation Under Violations of Distributional Assumptions**

Carol A. Van Hulle and Paul J. Rathouz

**Supplemental Table S1.** Percent of Simulated LRT Statistics Under the Null Hypothesis Exceeding Critical Value for Pairs of Nested Models Based on 2,000 replicates of *N* = 1,000.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  |  |  |  |  |  | % Type I error rates  |
|  |  | DGM | LRT df |  | Ordinalizeda on *P* |  | Censoredb on *P* |
| Model for HA |  | Model for H0 |  | Condition of H­0  |  |  | 10 | 5 | 1 |  | 10 | 5 | 1 |
| Cholesky with GxM | (3) | Cholesky | (2) | high r­AM | 6 |  | 20.8 | 11.7 | 2.7 |  | 5.4 | 2.7 | 0.6 |
|  |  |  |  | low rAM | 6 |  | 28.3 | 17.7 | 5.4 |  | 7.8 | 3.4 | 0.9 |
| NL main effects | (4\*) | Lin main effects | (4†) |  | 1 |  | 13.4 | 7.3 | 1.6 |  | 8.8 | 4.2 | 1.1 |
| Cholesky | (2) | Lin Main effects | (4†) |  | 2 |  | 9.6 | 4.9 | 0.7 |  | 9.3 | 4.3 | 0.9 |

Note: *P* refers to a phenotype of interest, *M* refers to a putative moderator; LRT refers to the likelihood ratio test.

aData divided into groups of size 12%, 20%, 30%, 20%, 10%, and 8% and assigned a score from 0 to 5.

b Bottom 10% assigned the 10th percentile score and top 5% assigned the 95th percentile score.



**Supplementary Figure S1.** Example of distribution for ordinalized (left panel) or censored data (right panel) after imposing less severe deviations on normality. For ordinalized data, scores were divided into groups of size 12%, 20%, 30%, 20%, 10%, and 8% and assigned a value from 0 to 5. Data were censored by replacing scores in the bottom 10% with the value of the 10th percentile and replacing scores in the top 5% with the value of the 95th percentile.

Note: For left panel *M* = 2.1, *SD* = 1.4, Skew = 0.3, Kurtosis=-0.7; for right panel *M* = 0.5, *SD* = 1.2, Skew = 0.2, Kurtosis = -1.0.