Supplementary Materials of

Using genetic risk score approaches to infer whether an environmental factor attenuates or exacerbates the adverse influence of a candidate gene

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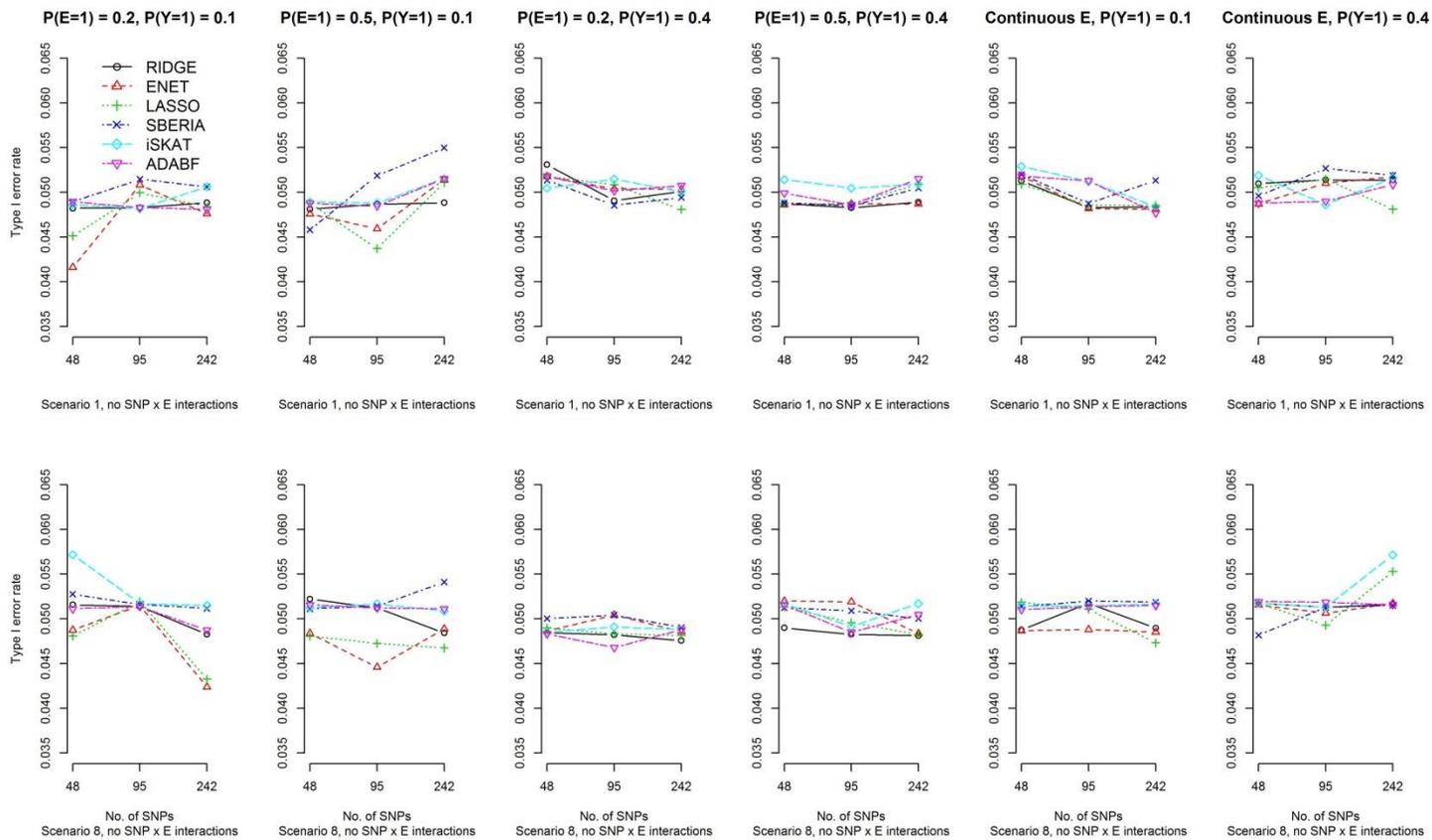Phone/Fax: +886-2-33668106;   E-mail: linwy@ntu.edu.tw

Figure S1 Empirical type I error rates under the nominal significance level of 0.05 (binary trait)
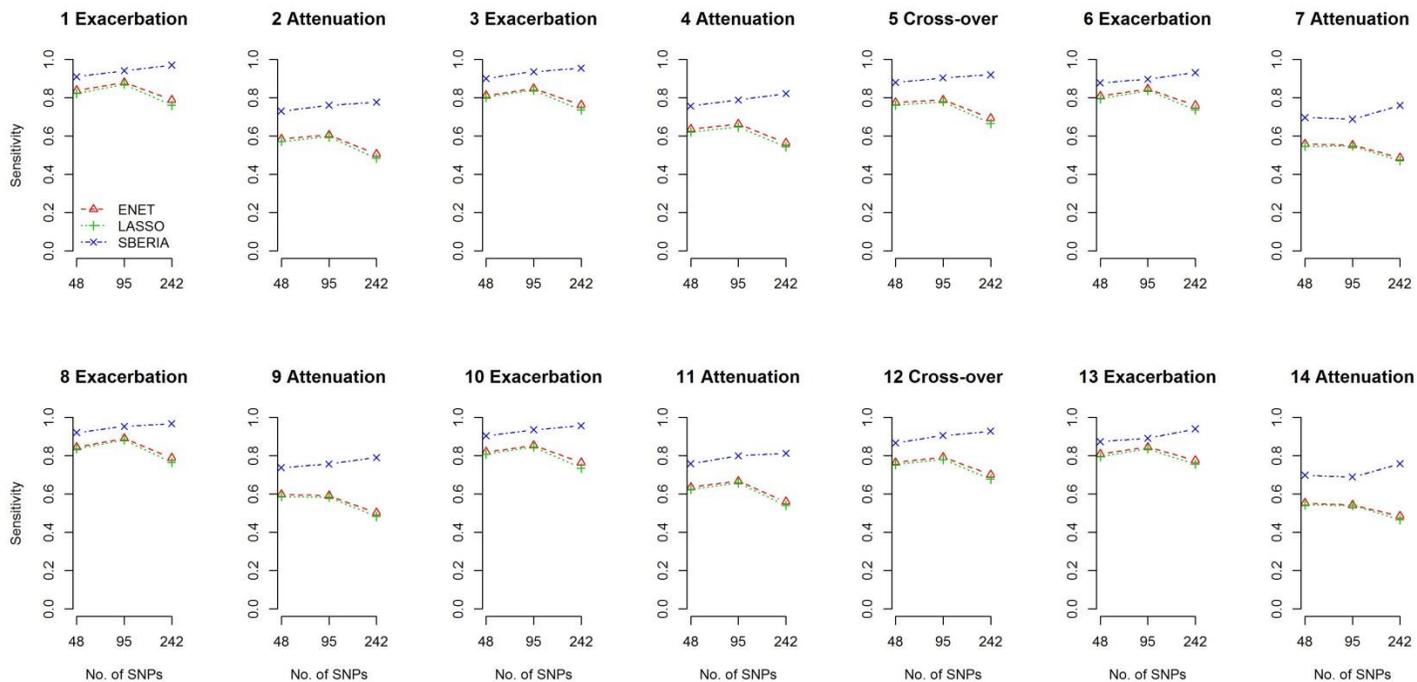
Figure S2 The sensitivity of the marginal-association filtering in ENET, LASSO, and SBERIA, for continuous traits and $P(E = 1) = 0.2$
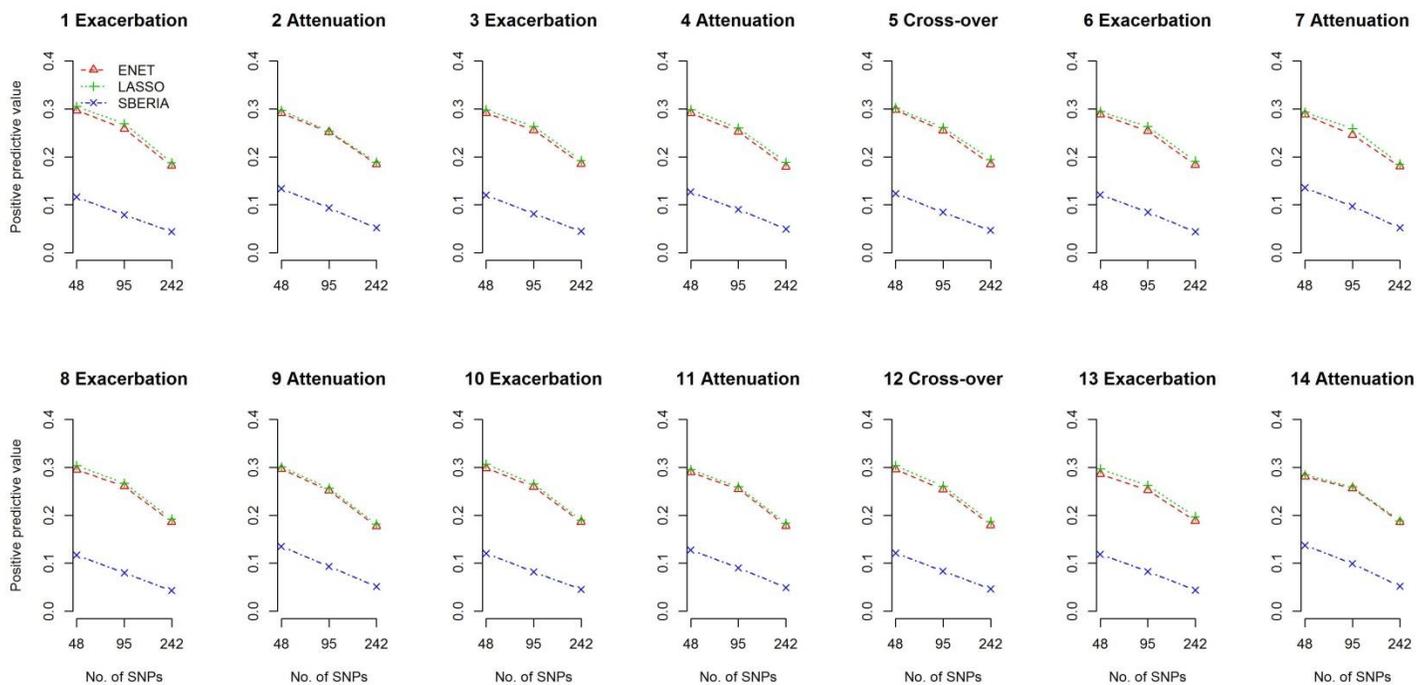

Figure S3 The positive predictive value of the marginal-association filtering in ENET, LASSO, and SBERIA, for continuous traits and $P(E = 1) = 0.2$
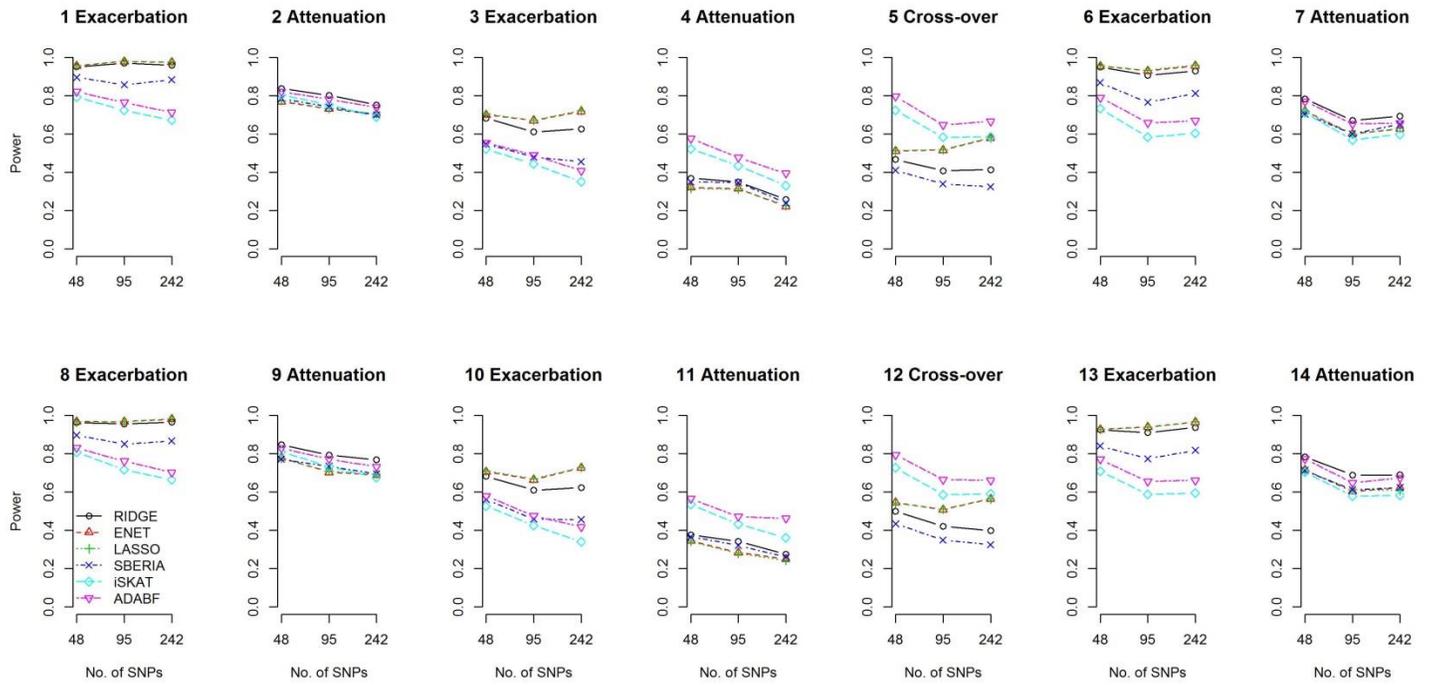
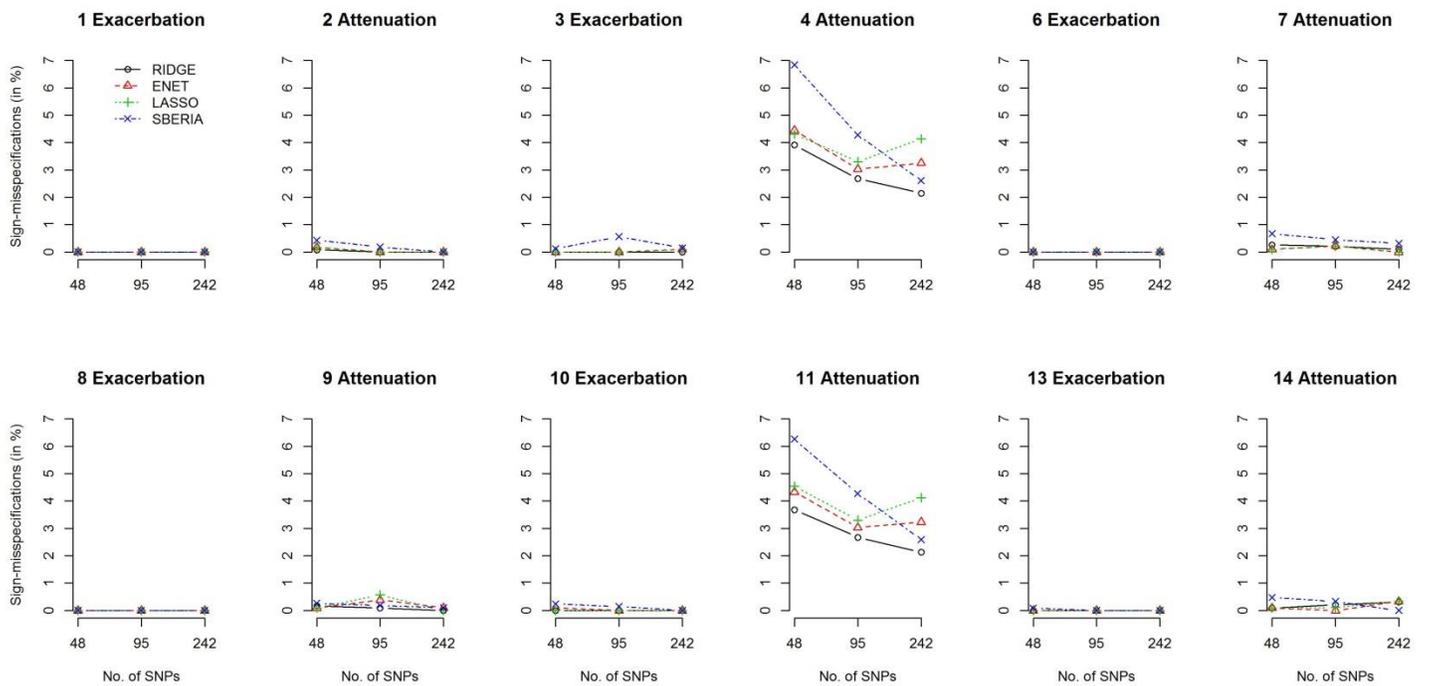**Figure S4**   Power given a significance level of 0.05, for continuous traits and $P(E = 1) = 0.5$

Figure S5   Percentages of sign-misspecifications for γ_{Int}, under continuous traits and $P(E = 1) = 0.5$
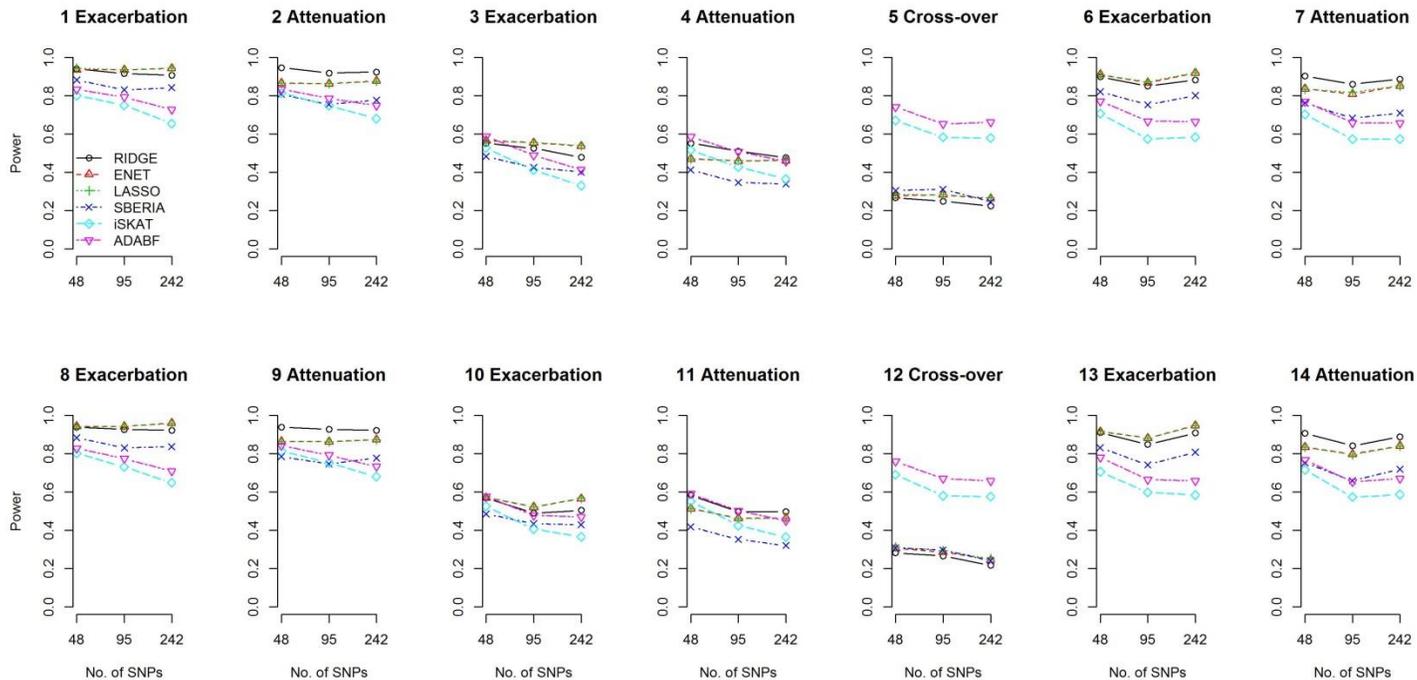
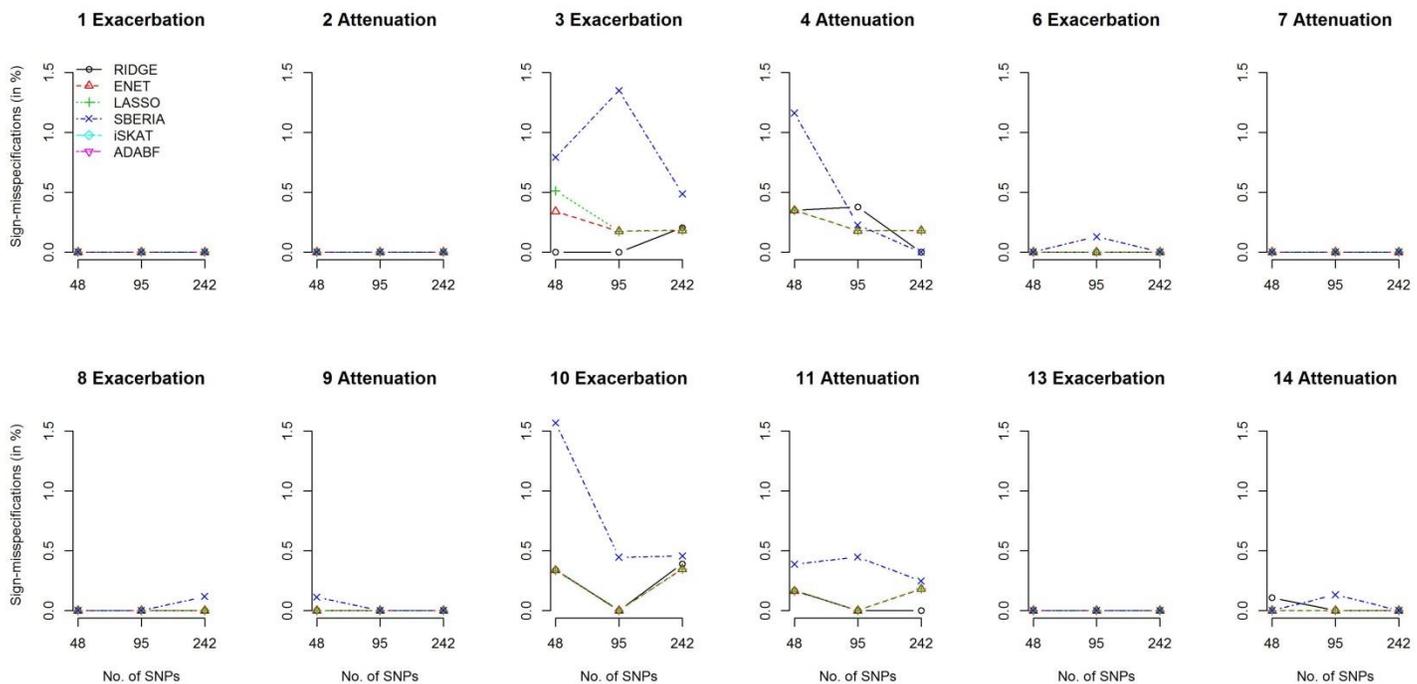**Figure S6** Power given a significance level of 0.05, for continuous traits and a continuous E

Figure S7 Percentages of sign-misspecifications for γ_{Int}, under continuous traits and a continuous E
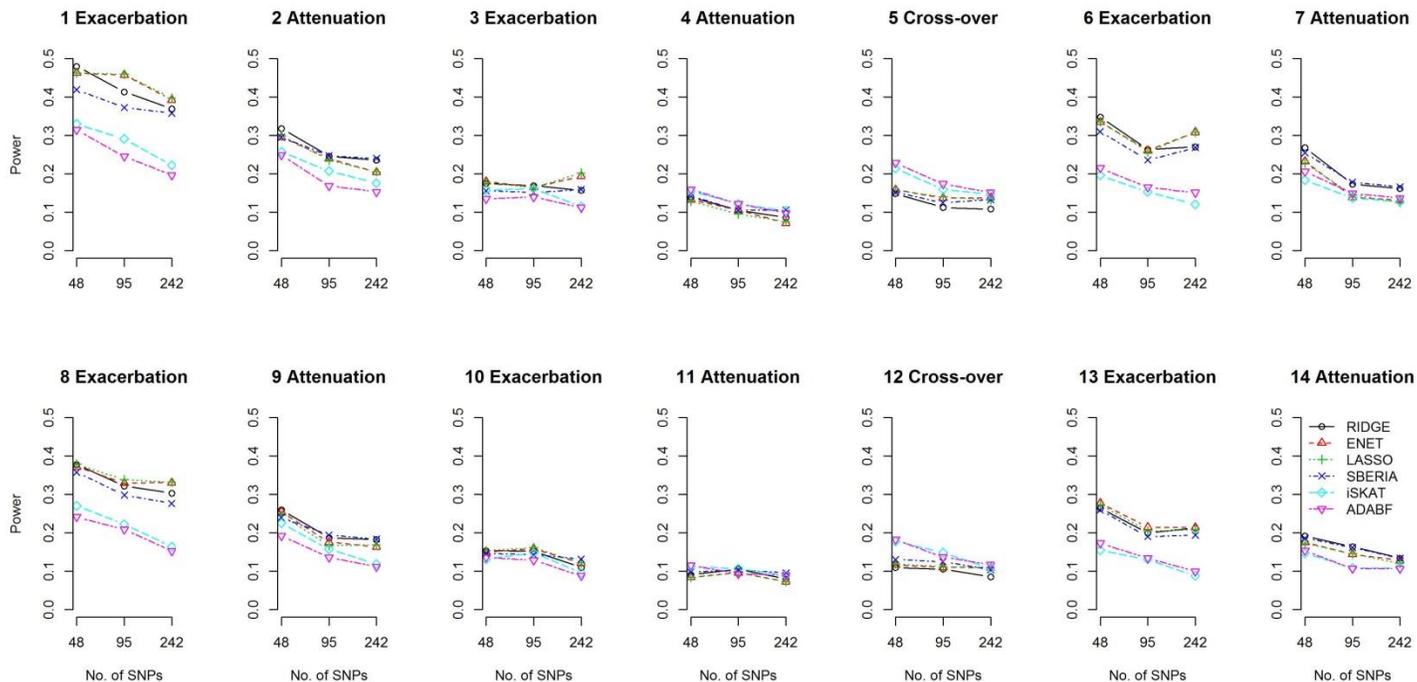
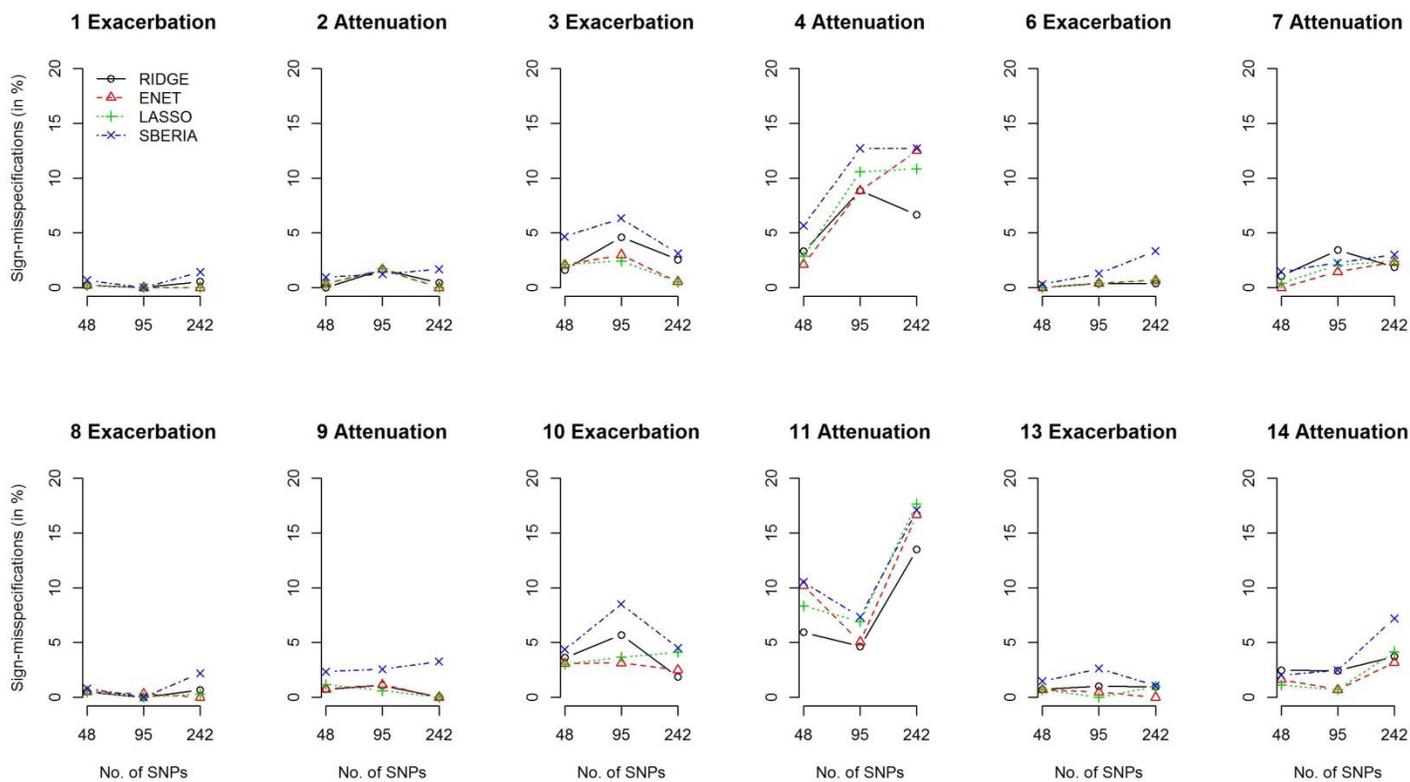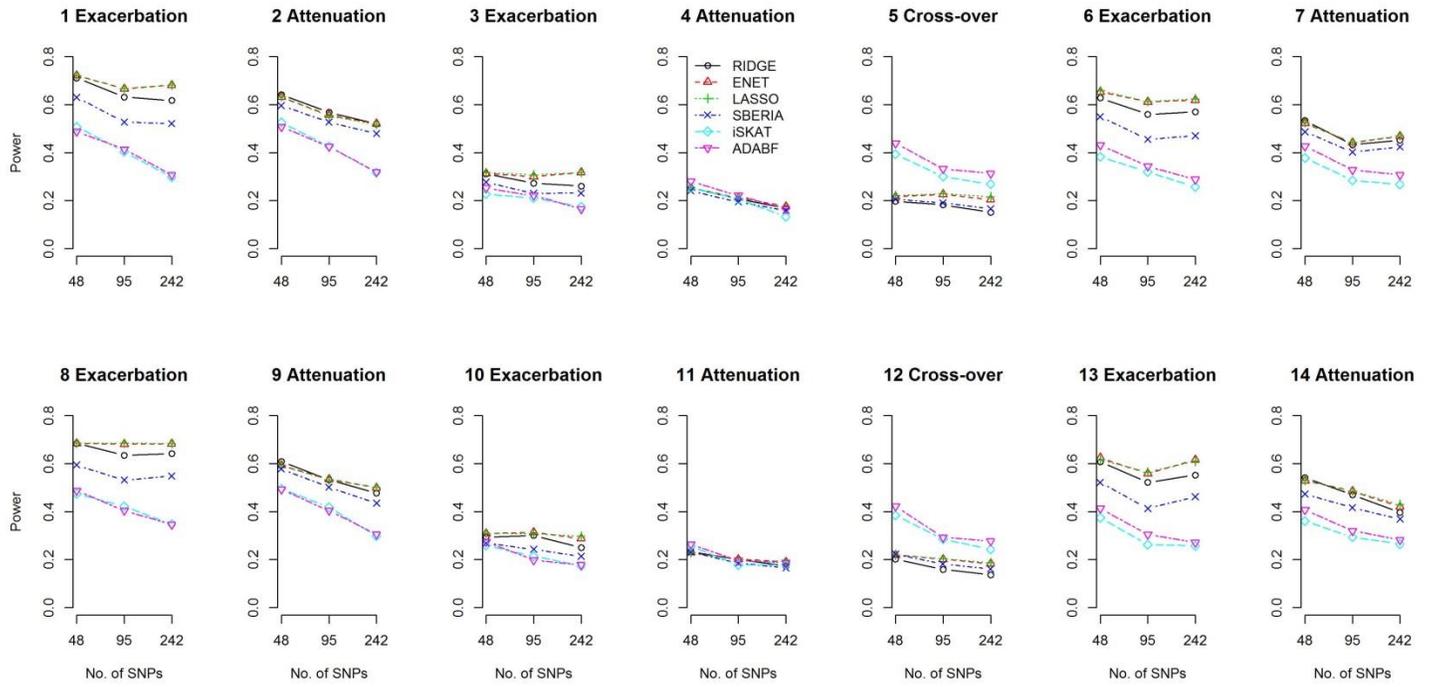**Figure S8**   Power given a significance level of 0.05, for binary traits, $P(Y = 1) = 0.1$, and $P(E = 1) = 0.2$

Figure S9   Percentages of sign-misspecifications for γ_{Int}, under binary traits, $P(Y = 1) = 0.1$, and

$P(E = 1) = 0.2$

Figure S10   Power given a significance level of 0.05, for binary traits, $P(Y = 1) = 0.4$, and $P(E = 1) = 0.2$
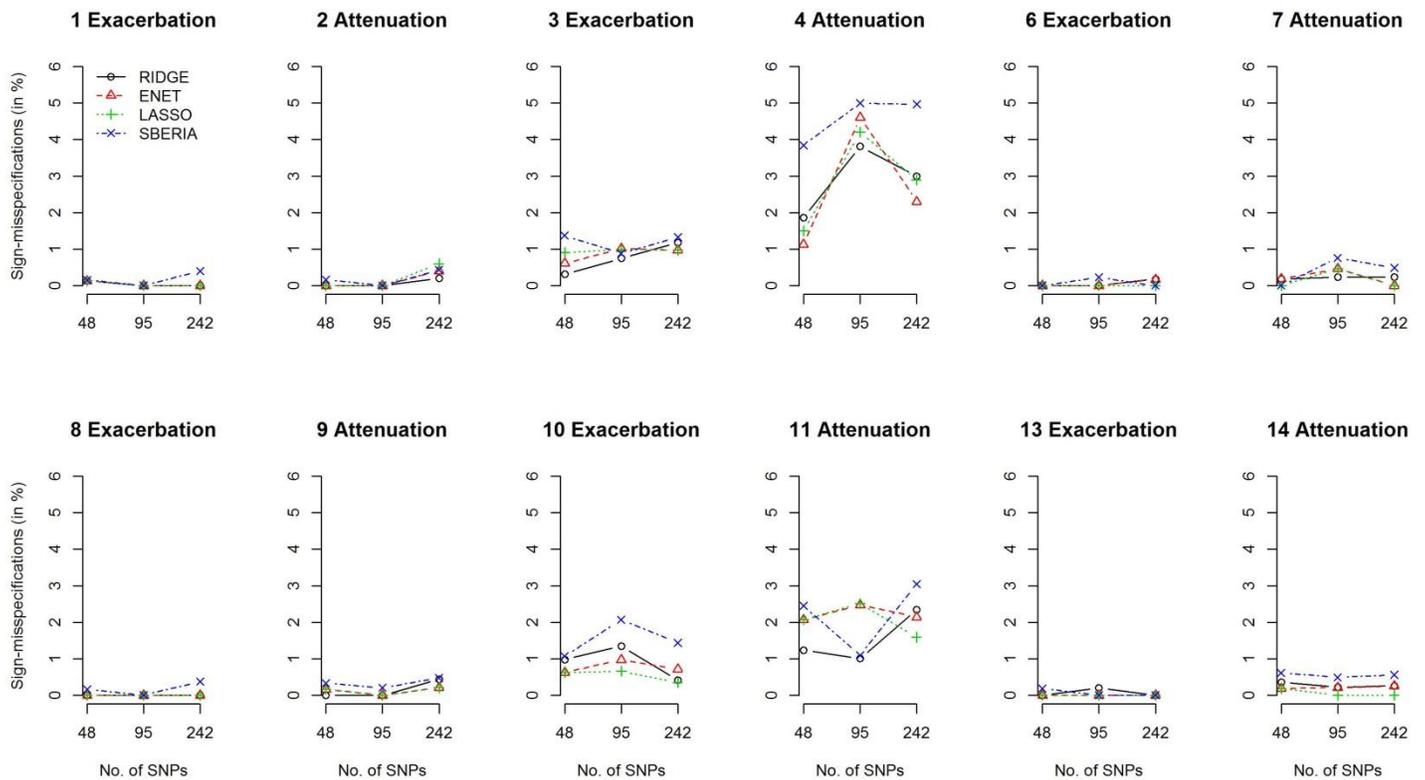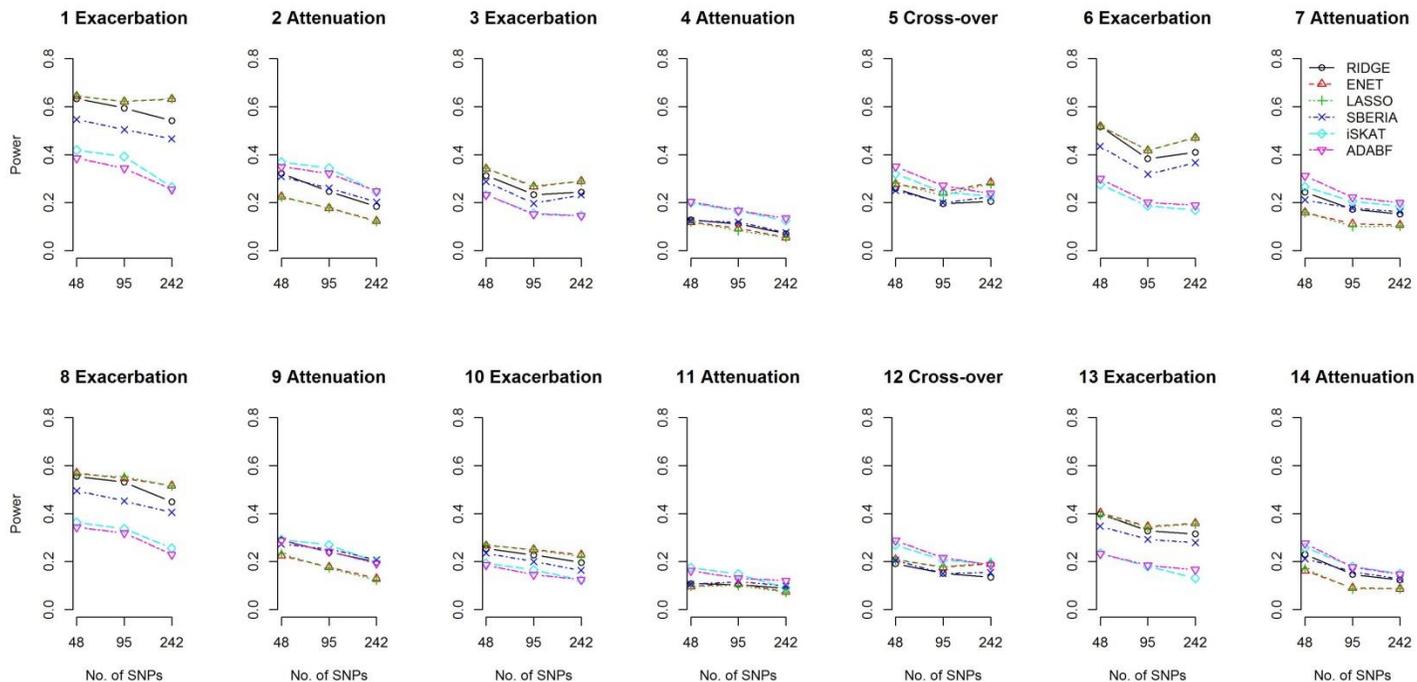

Figure S11   Percentages of sign-misspecifications for γ_{Int}, under binary traits, $P(Y = 1) = 0.4$, and

$P(E = 1) = 0.2$

Figure S12 Power given a significance level of 0.05, for binary traits, $P(Y = 1) = 0.1$, and $P(E = 1) = 0.5$
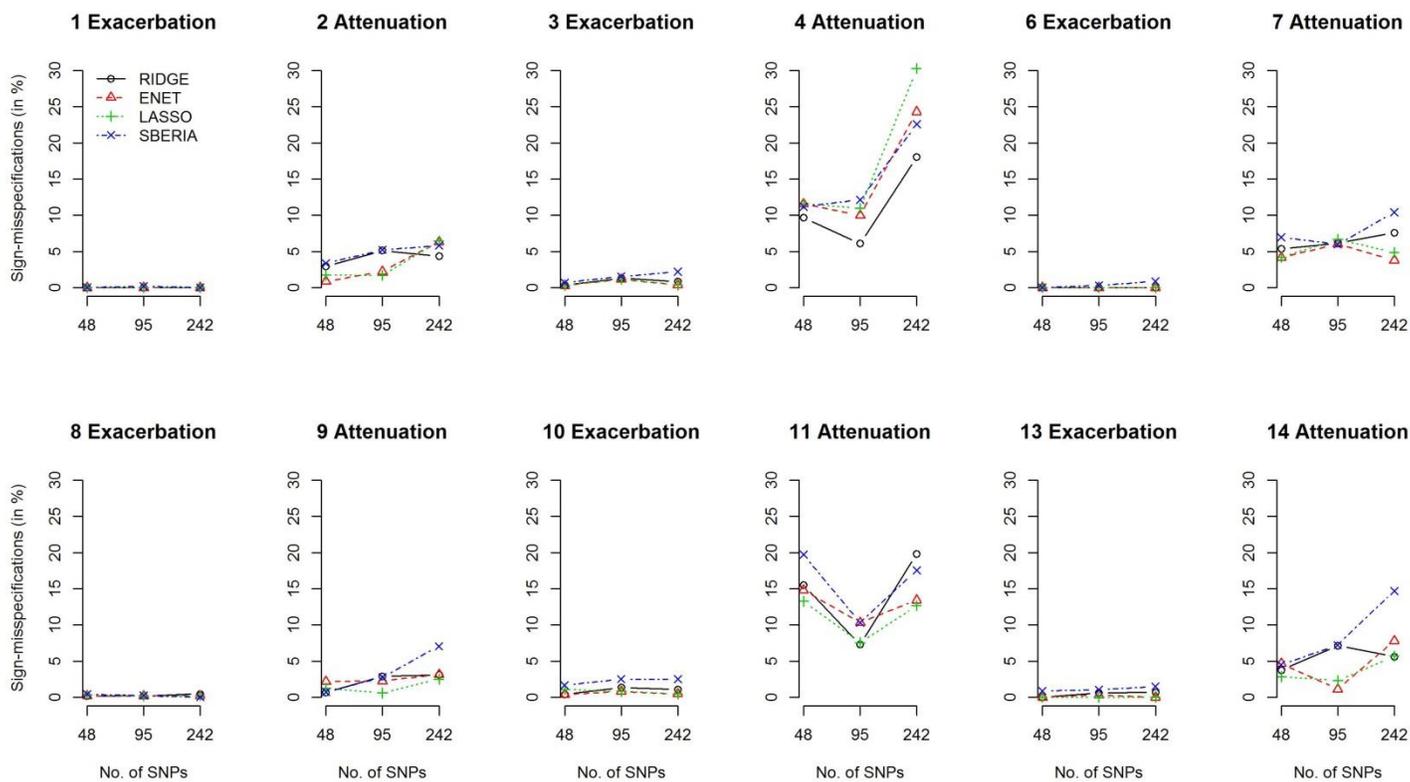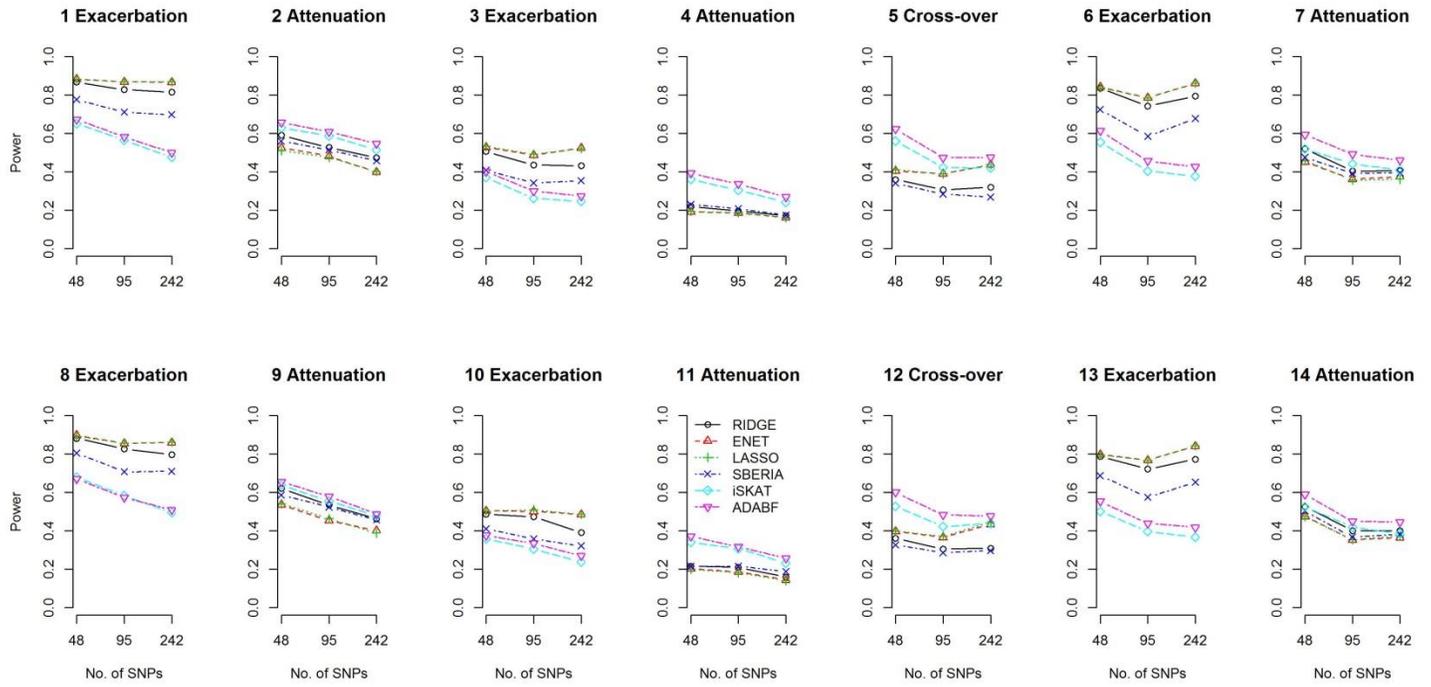

Figure S13 Percentages of sign-misspecifications for γ_{Int}, under binary traits, $P(Y = 1) = 0.1$, and

$P(E = 1) = 0.5$

Figure S14 Power given a significance level of 0.05, for binary traits, $P(Y = 1) = 0.4$, and $P(E = 1) = 0.5$
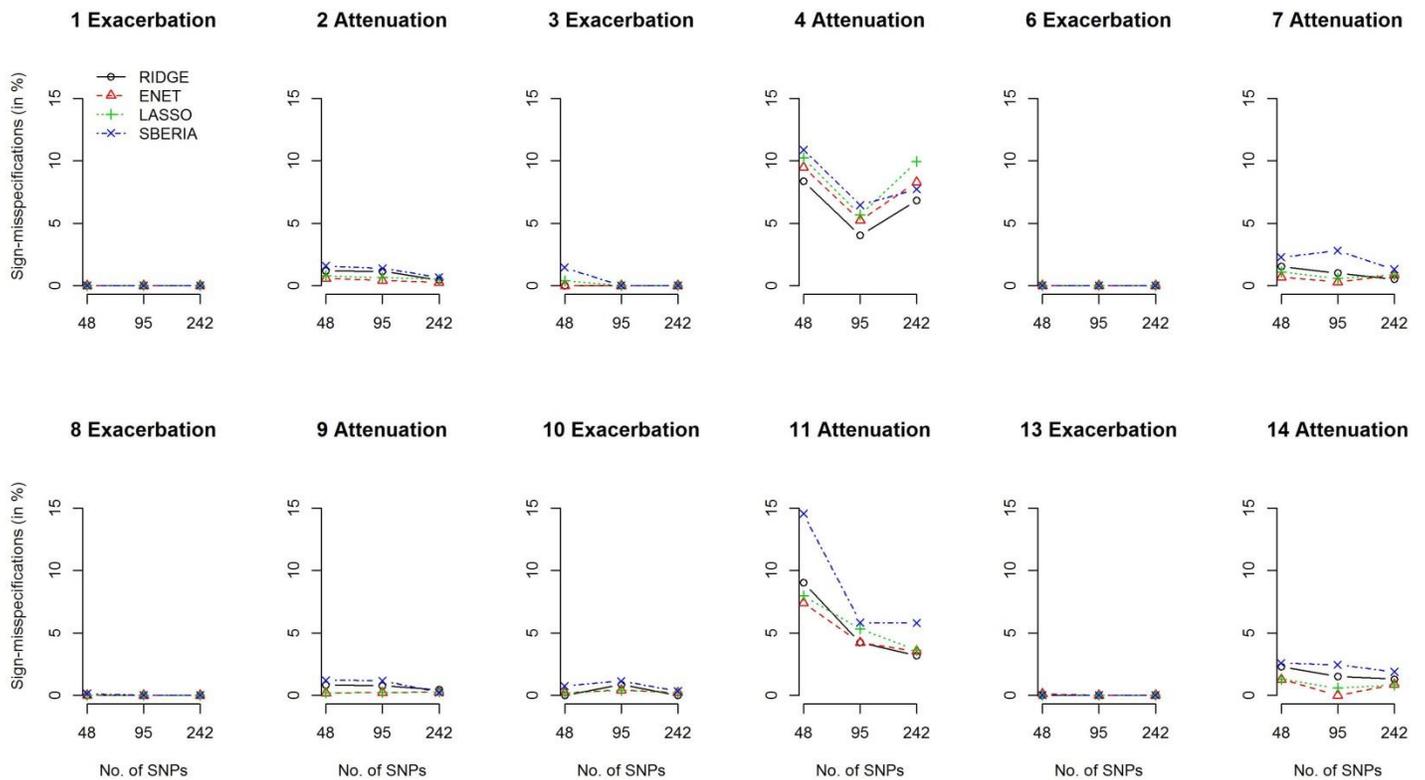

Figure S15 Percentages of sign-misspecifications for γ_{Int}, under binary traits, $P(Y = 1) = 0.4$, and
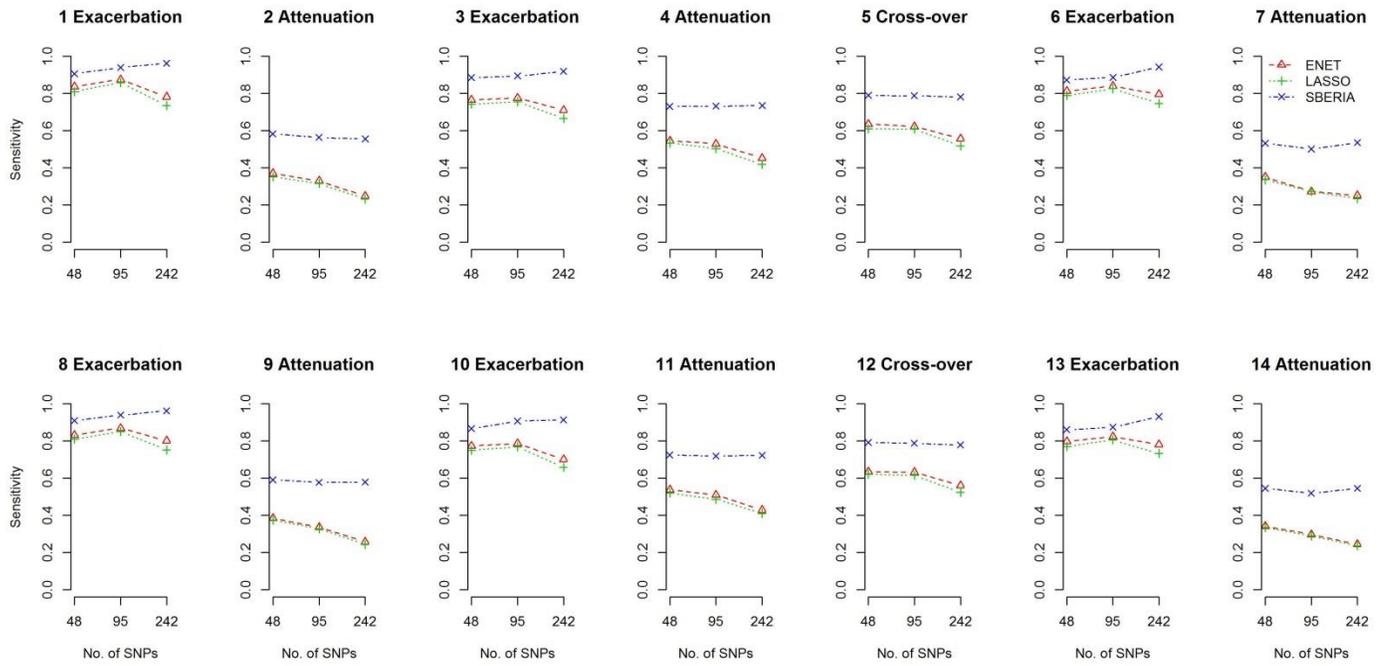
$P(E = 1) = 0.5$

Figure S16 The sensitivity of the marginal-association filtering in ENET, LASSO, and SBERIA, for binary traits, $P(Y = 1) = 0.4$, and $P(E = 1) = 0.5$
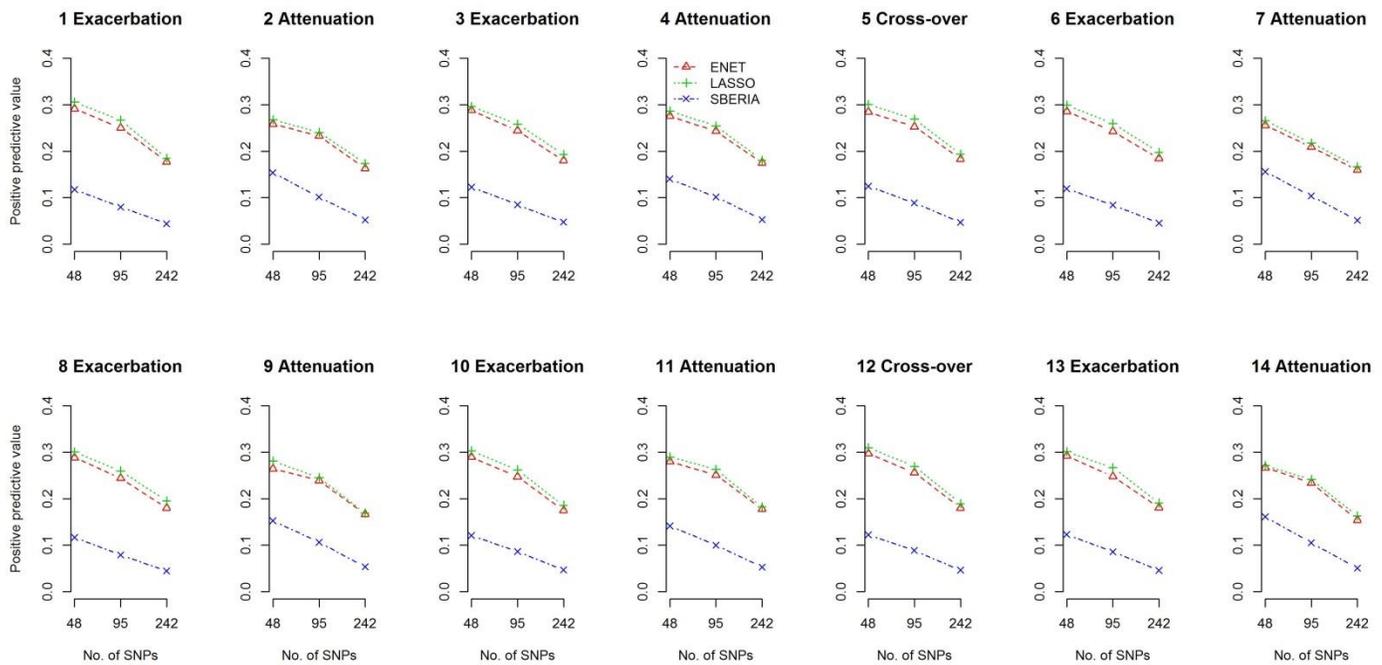

Figure S17 The positive predictive value of the marginal-association filtering in ENET, LASSO, and SBERIA, for binary traits, $P(Y = 1) = 0.4$, and $P(E = 1) = 0.5$
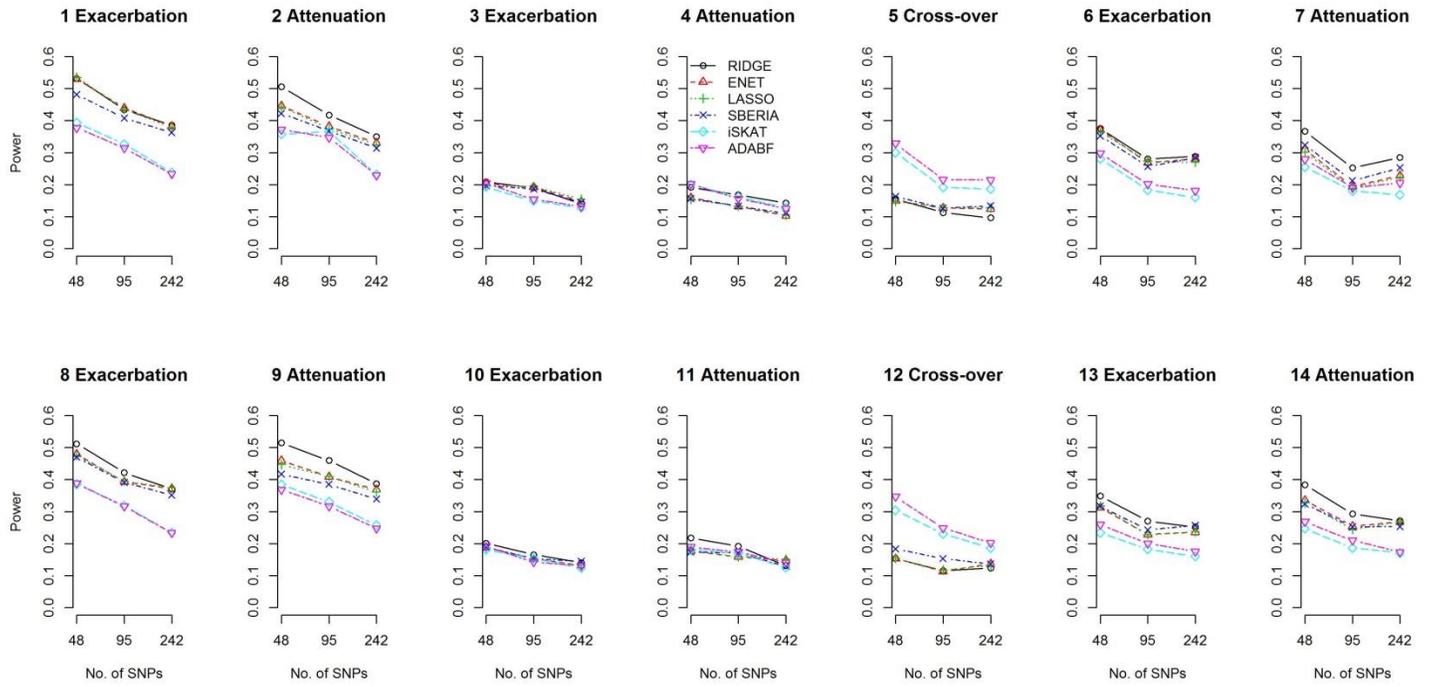
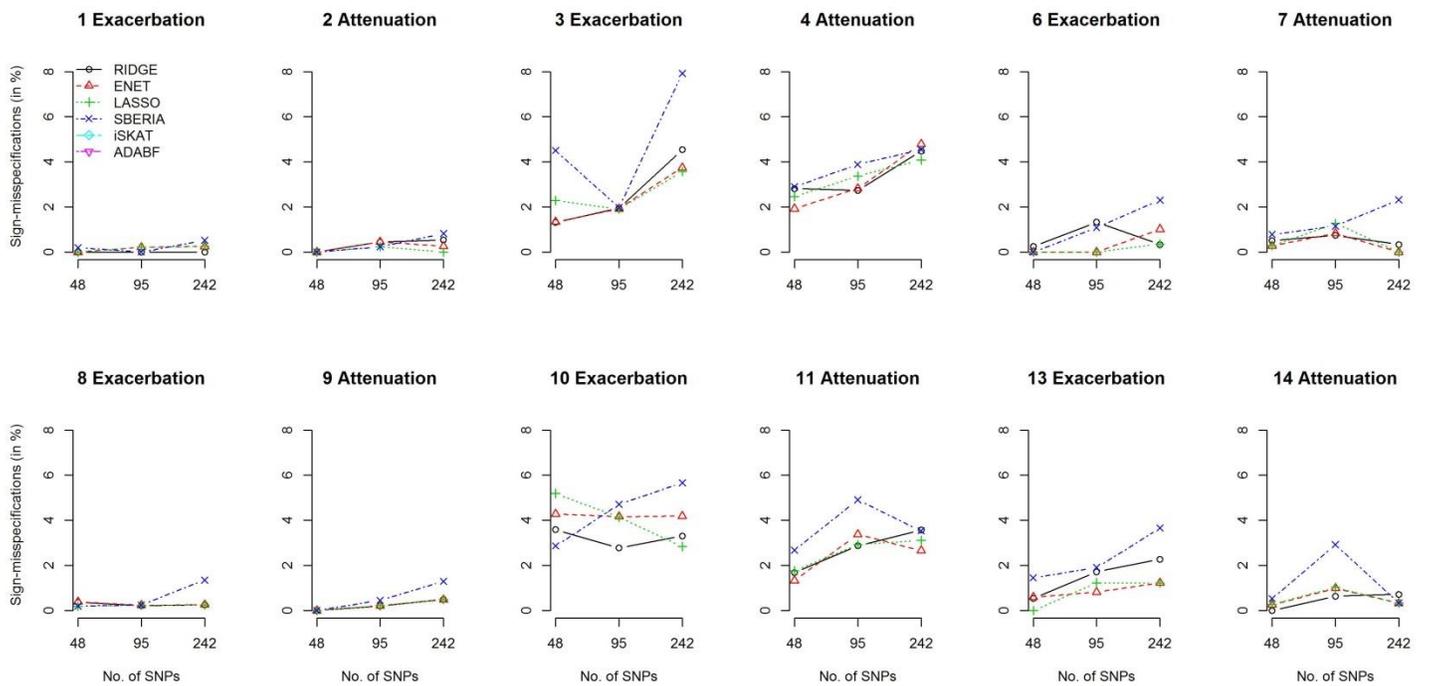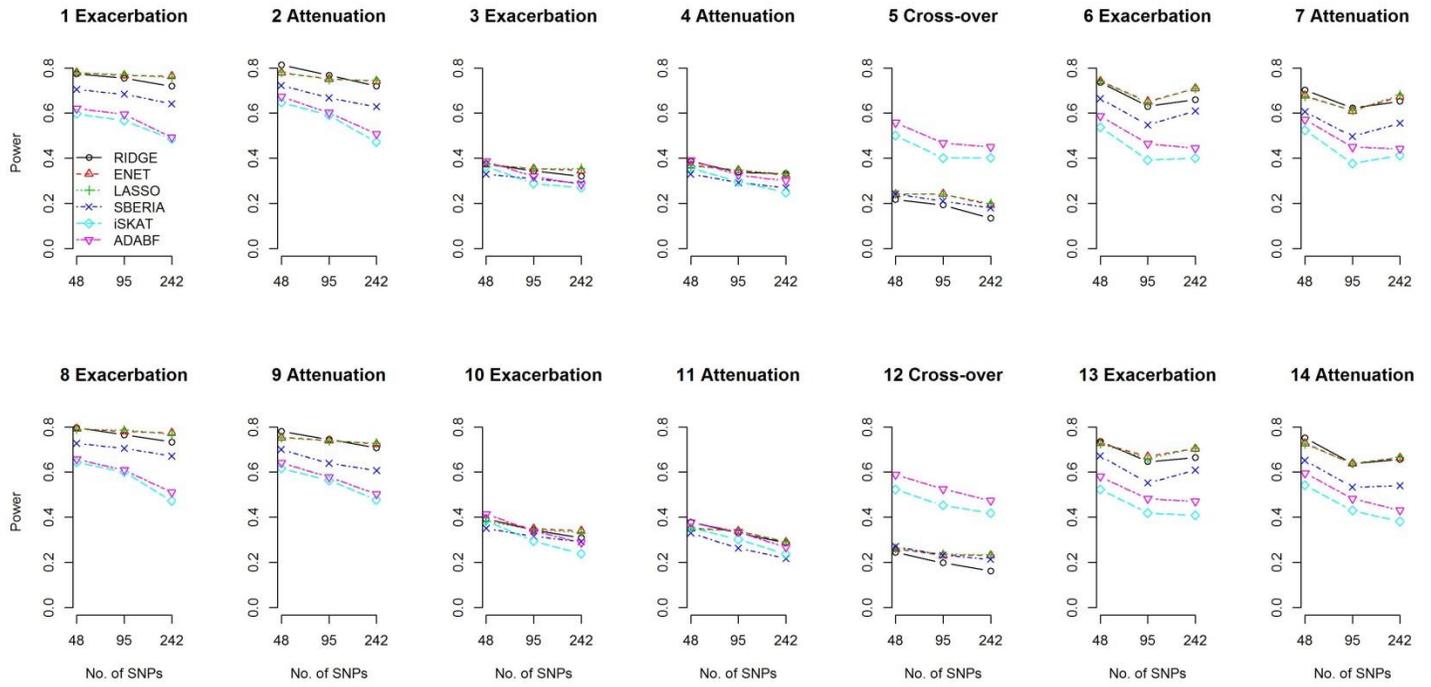**Figure S18** Power given a significance level of 0.05, for binary traits, $P(Y = 1) = 0.1$, and a continuous E

Figure S19 Percentages of sign-misspecifications for γ_{Int}, under binary traits, $P(Y = 1) = 0.1$, and a

continuous E

Figure S20   Power given a significance level of 0.05, for binary traits, $P(Y = 1) = 0.4$, and a continuous E
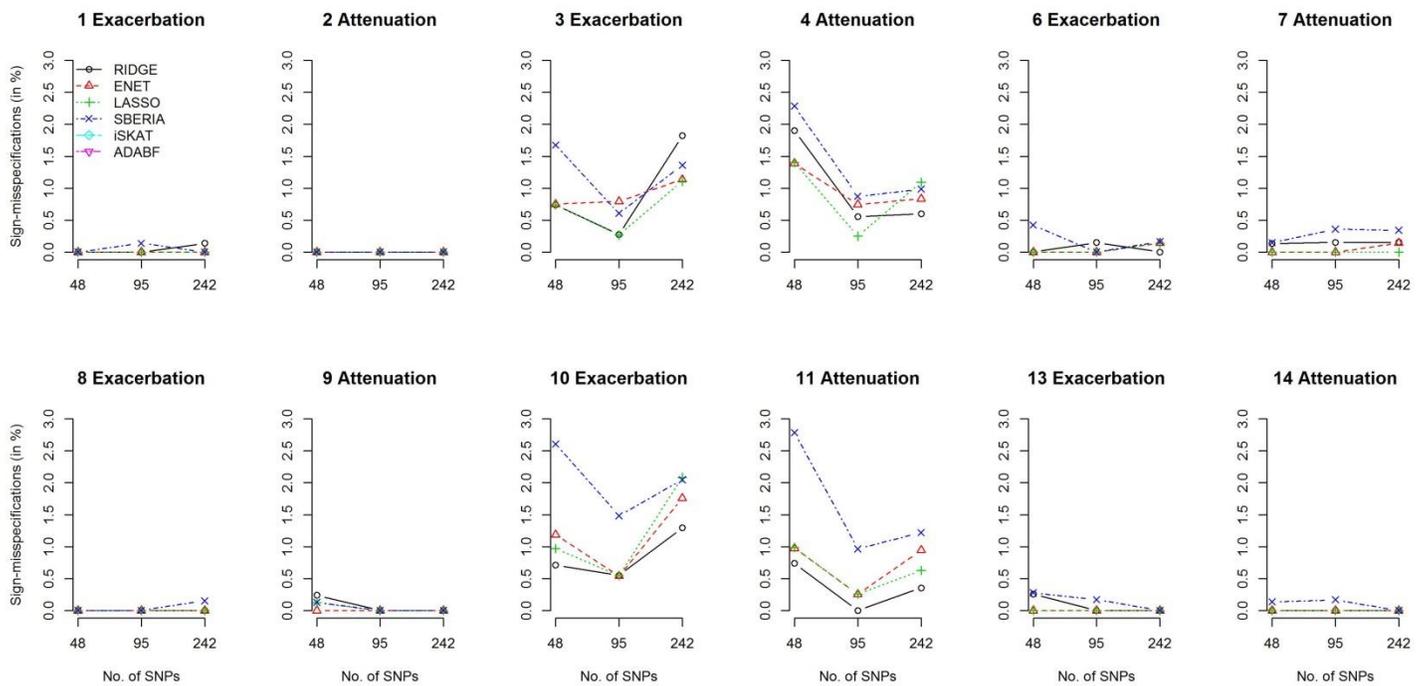

Figure S21   Percentages of sign-misspecifications for γ_{Int}, under binary traits, $P(Y = 1) = 0.4$, and a
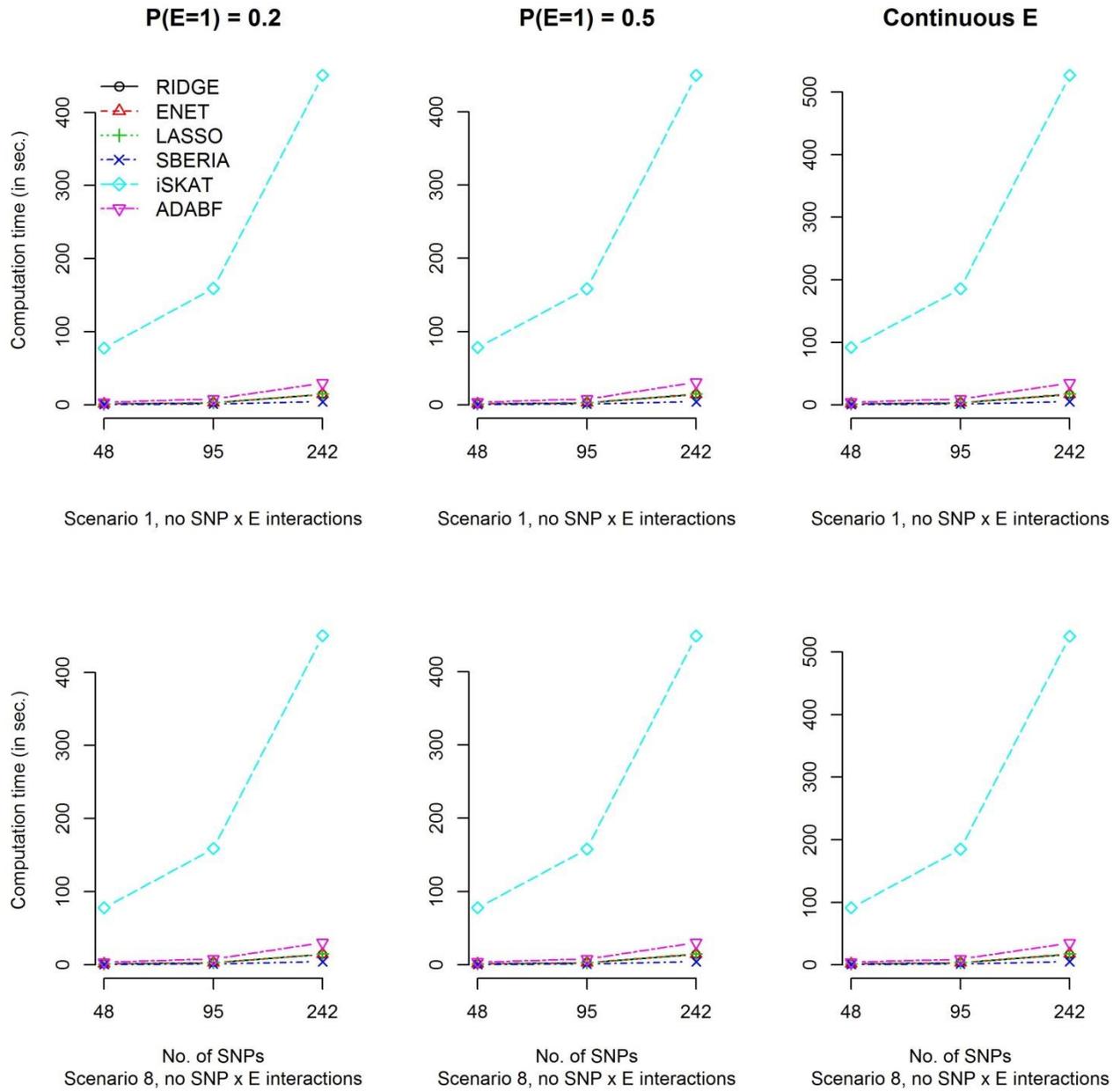
continuous E

Figure S22   Average time spent (in seconds) for each simulation replication, under H_0, for continuous traits.
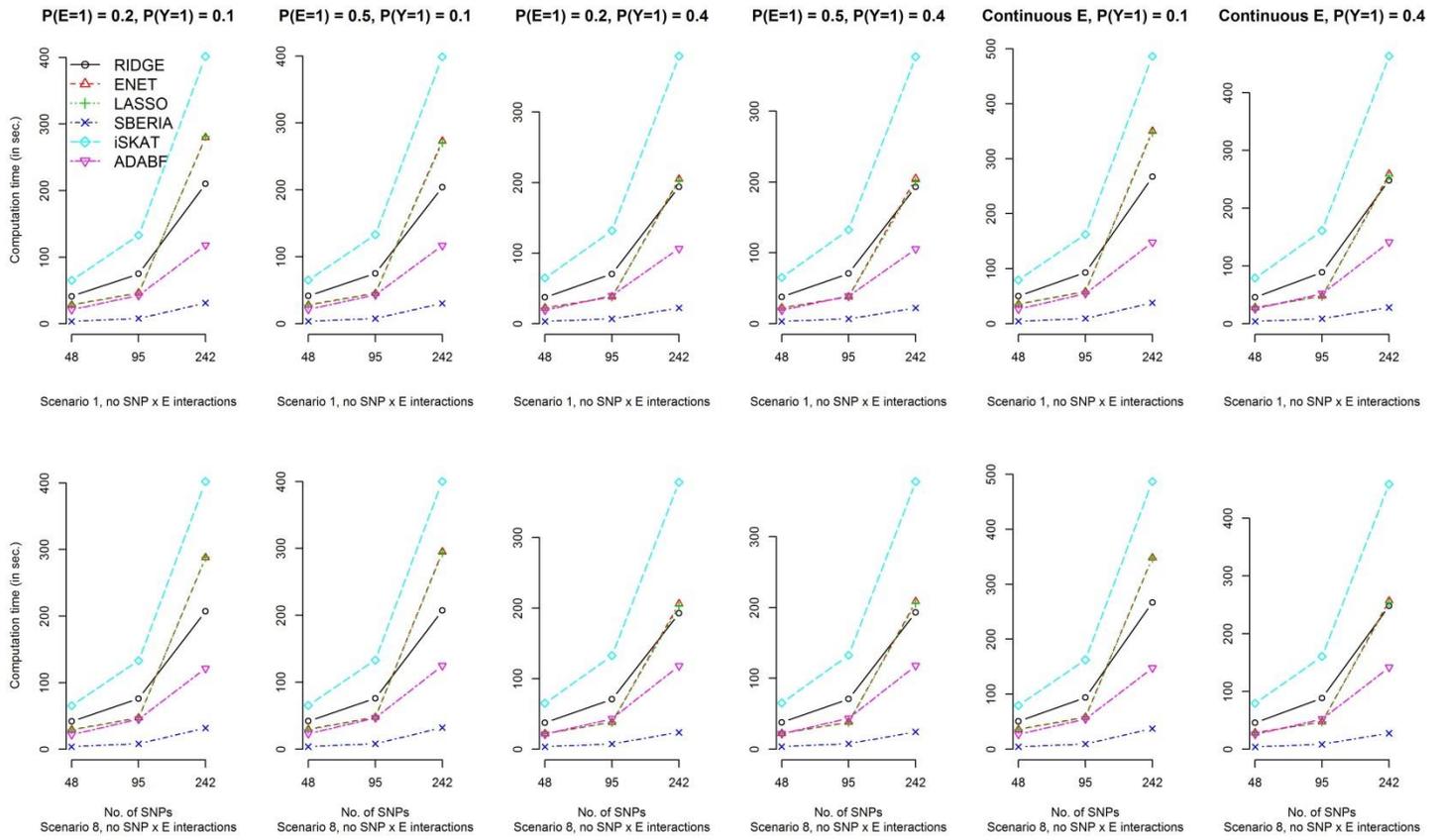
Figure S23   Average time spent (in seconds) for each simulation replication, under H_0, for binary traits.
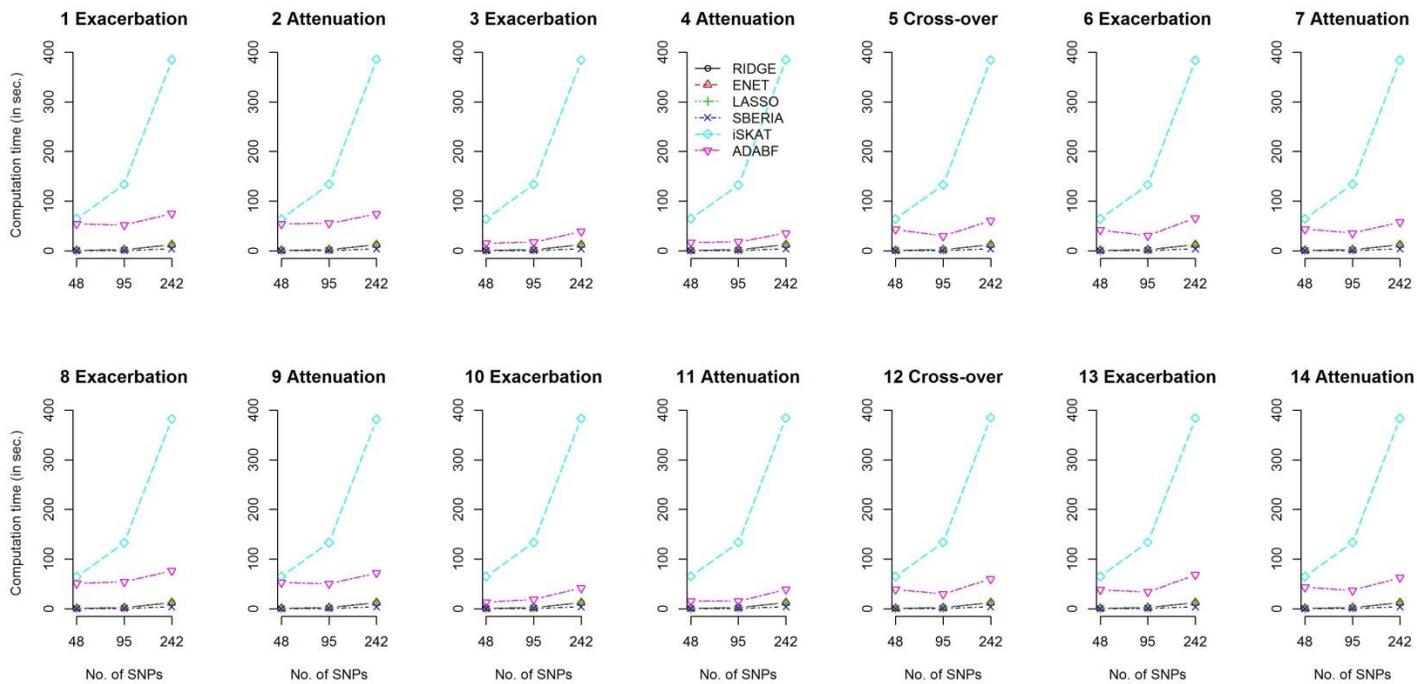
Figure S24 Average time spent (in seconds) for each simulation replication, under H_1, for continuous traits and $P(E = 1) = 0.2$
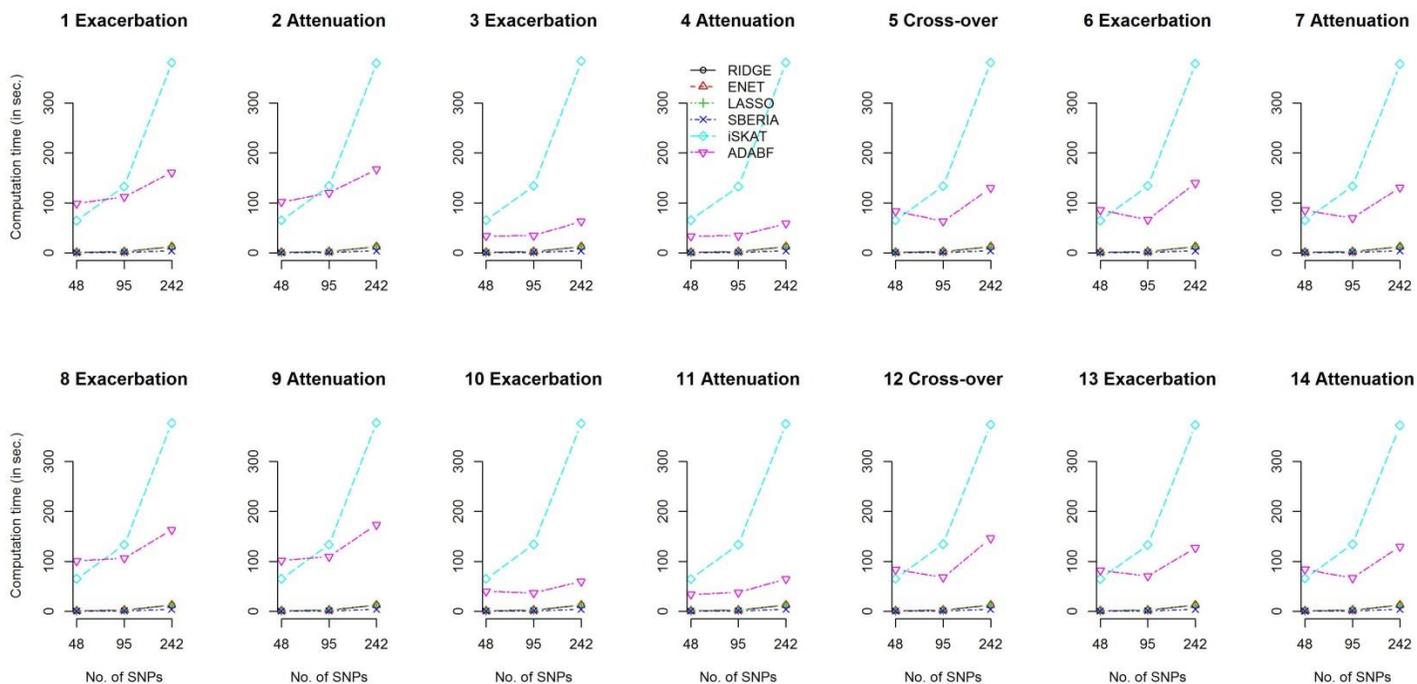

Figure S25 Average time spent (in seconds) for each simulation replication, under H_1, for continuous traits and $P(E = 1) = 0.5$
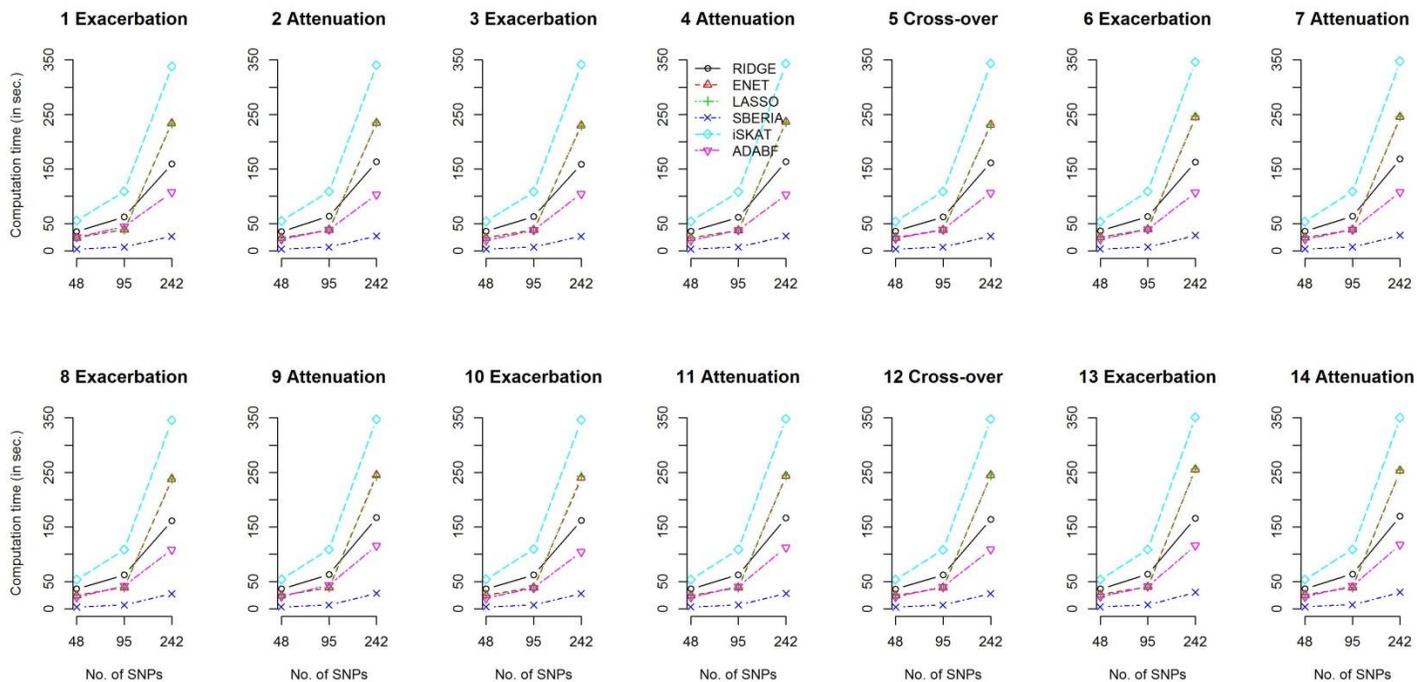
Figure S26 Average time spent (in seconds) for each simulation replication, under H_1, for binary traits, $P(Y = 1) = 0.1$, and $P(E = 1) = 0.2$
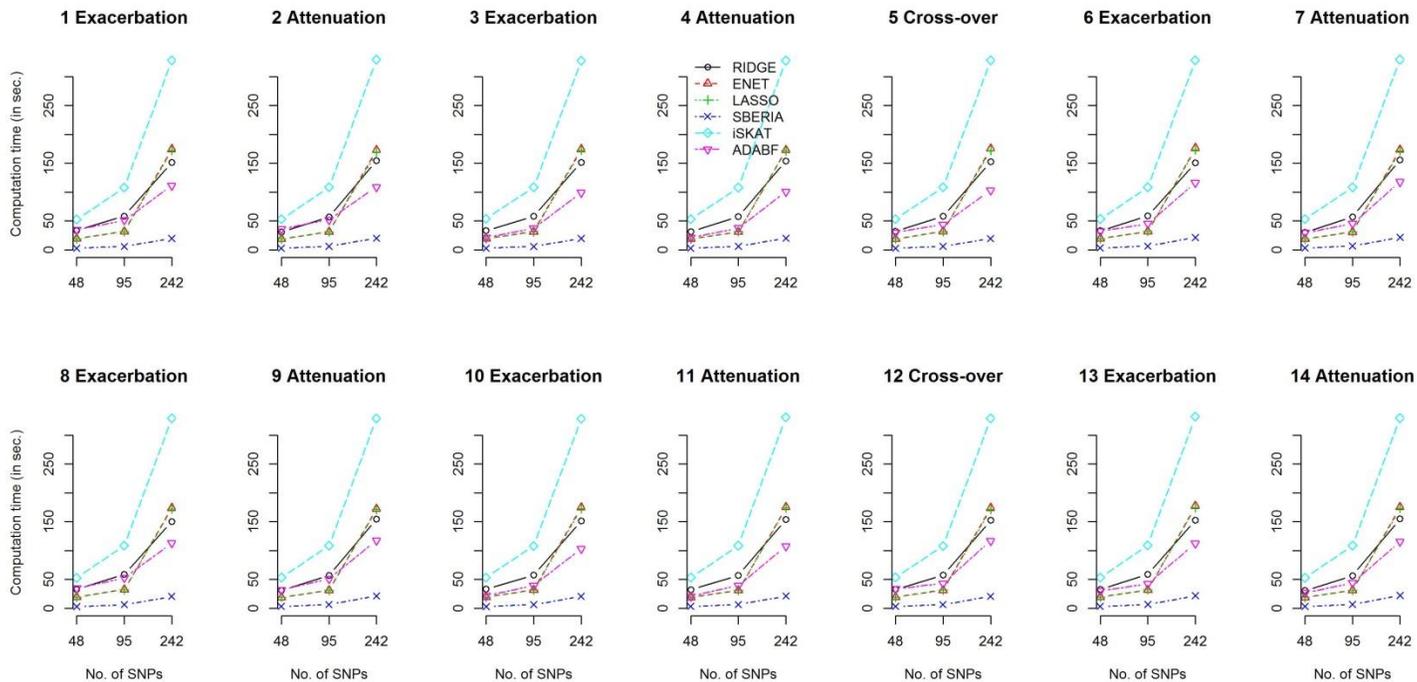

Figure S27 Average time spent (in seconds) for each simulation replication, under H_1, for binary traits, $P(Y = 1) = 0.4$, and $P(E = 1) = 0.2$
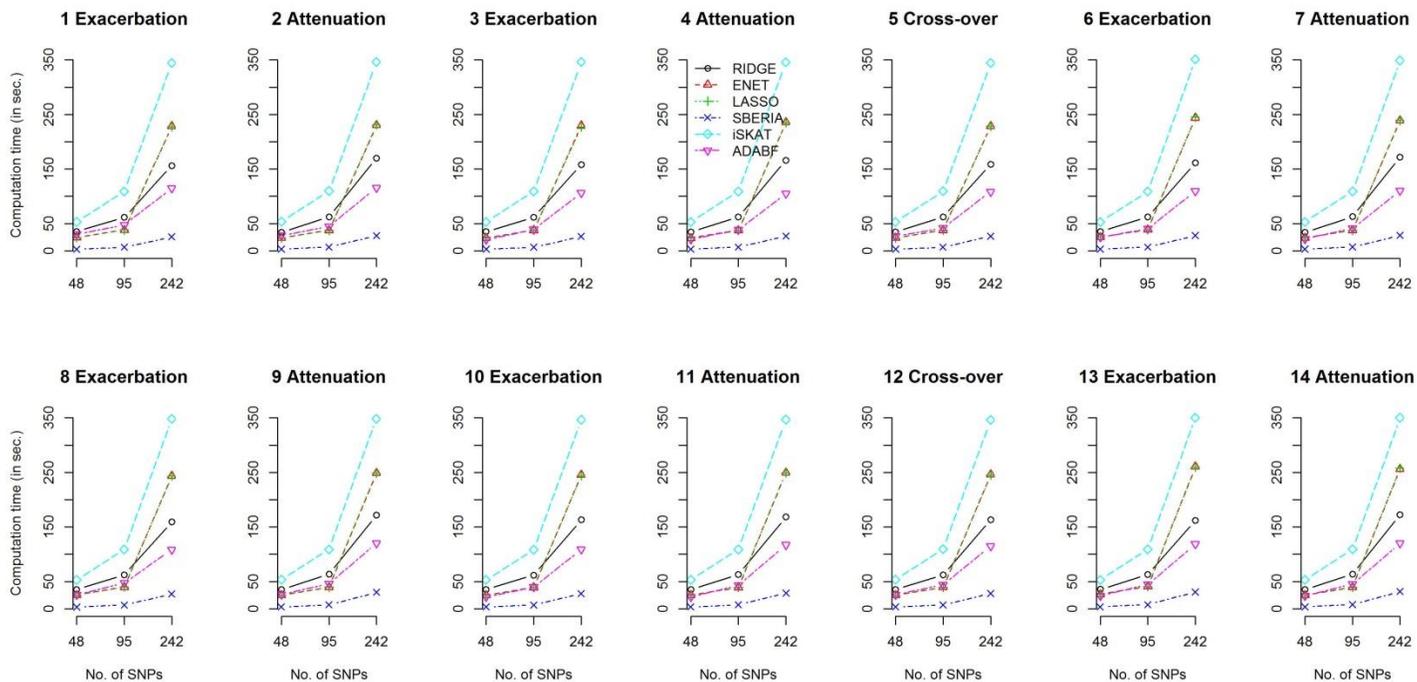
Figure S28 Average time spent (in seconds) for each simulation replication, under H_1, for binary traits, $P(Y = 1) = 0.1$, and $P(E = 1) = 0.5$
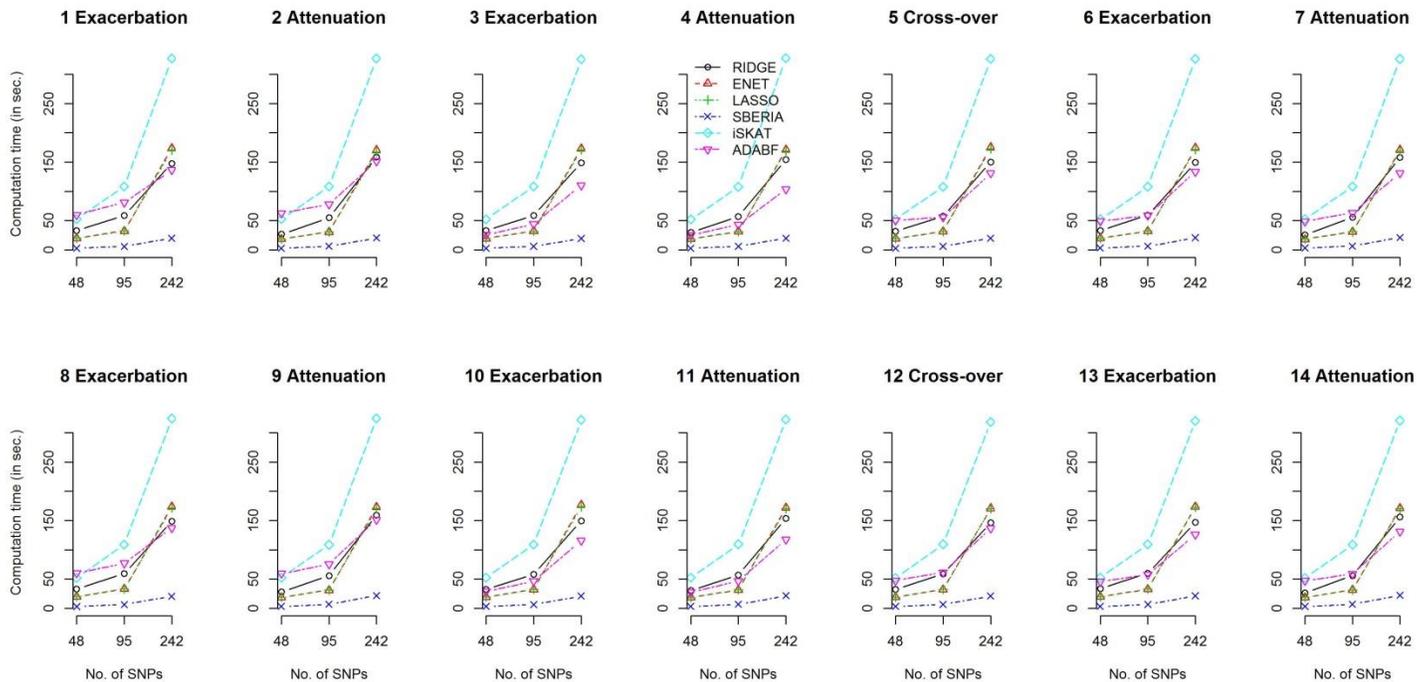

Figure S29 Average time spent (in seconds) for each simulation replication, under H_1, for binary traits, $P(Y = 1) = 0.4$, and $P(E = 1) = 0.5$