

Supplementary Material for General Additive Network Effect Models

S1 Additional Simulation Results for Section 4.1

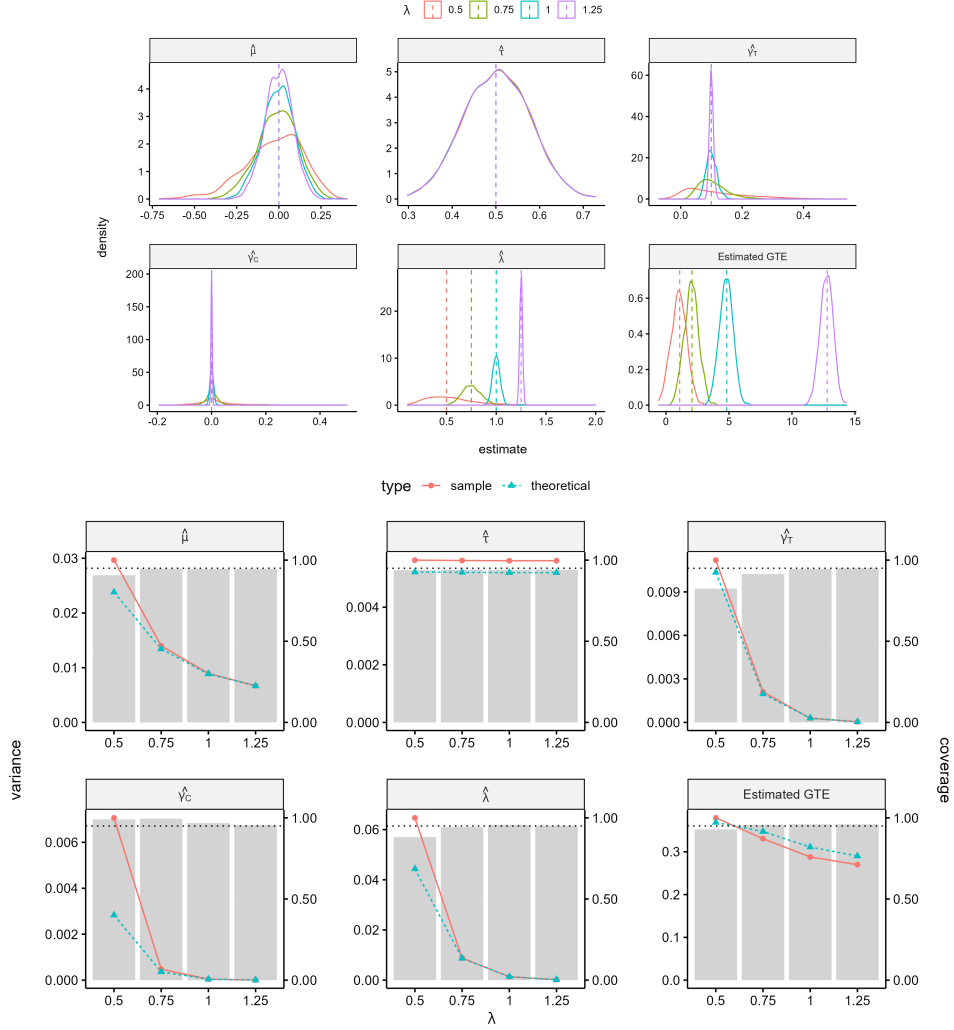


Figure S1: (upper) The distribution of parameter estimates of the POW-DEG specification on the Caltech Facebook network with $\mu = 0, \tau = 0.5, \gamma_T = 0.1, \gamma_C = 0.0$ and $\lambda \in \{0.05, 0.75, 1.00, 1.25\}$ over 1,000 simulation runs. (lower) The corresponding variances of the estimates (left axes, lines) and coverage rates (right axes, bars).

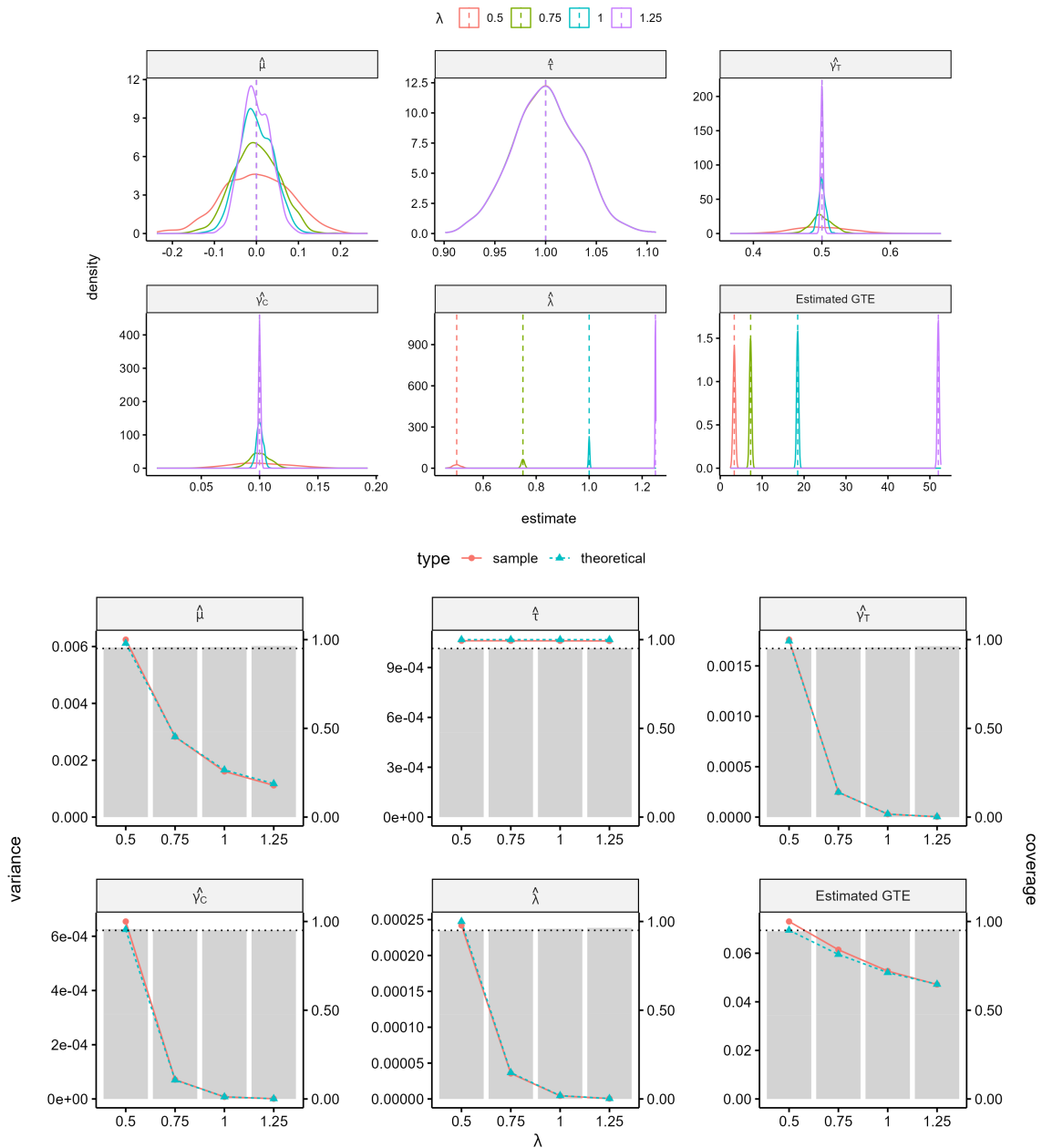


Figure S2: (upper) The distribution of parameter estimates of the POW-DEG specification on the UMich Facebook network with $\mu = 0, \tau = 1.0, \gamma_T = 0.5, \gamma_C = 0.1$ and $\lambda \in \{0.05, 0.75, 1.00, 1.25\}$ over 1,000 simulation runs. (lower) The corresponding variances of the estimates (left axes, lines) and coverage rates (right axes, bars).

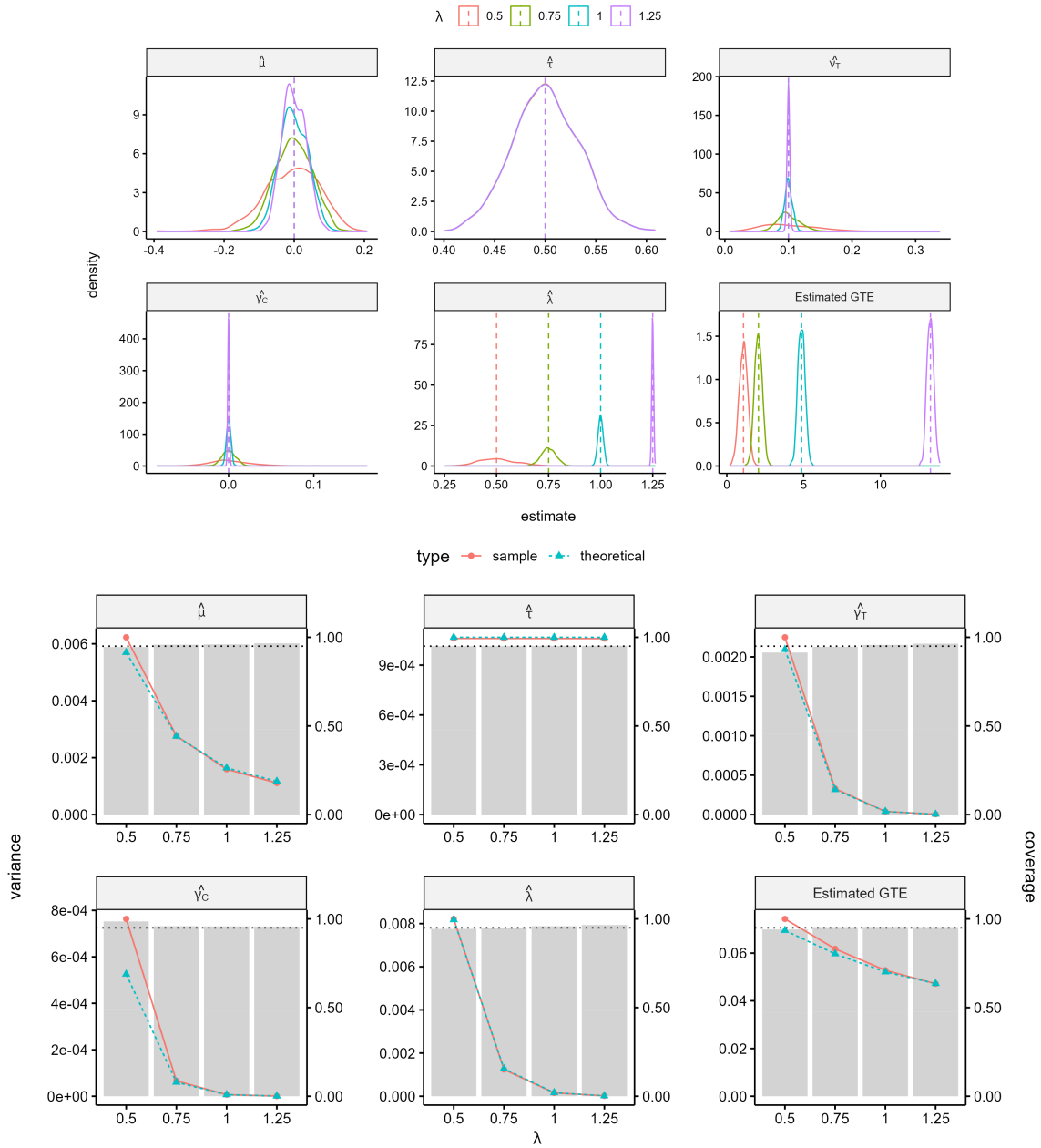


Figure S3: (upper) The distribution of parameter estimates of the POW-DEG specification on the UMich Facebook network with $\mu = 0, \tau = 0.5, \gamma_T = 0.1, \gamma_C = 0.0$ and $\lambda \in \{0.05, 0.75, 1.00, 1.25\}$ over 1,000 simulation runs. (lower) The corresponding variances of the estimates (left axes, lines) and coverage rates (right axes, bars).

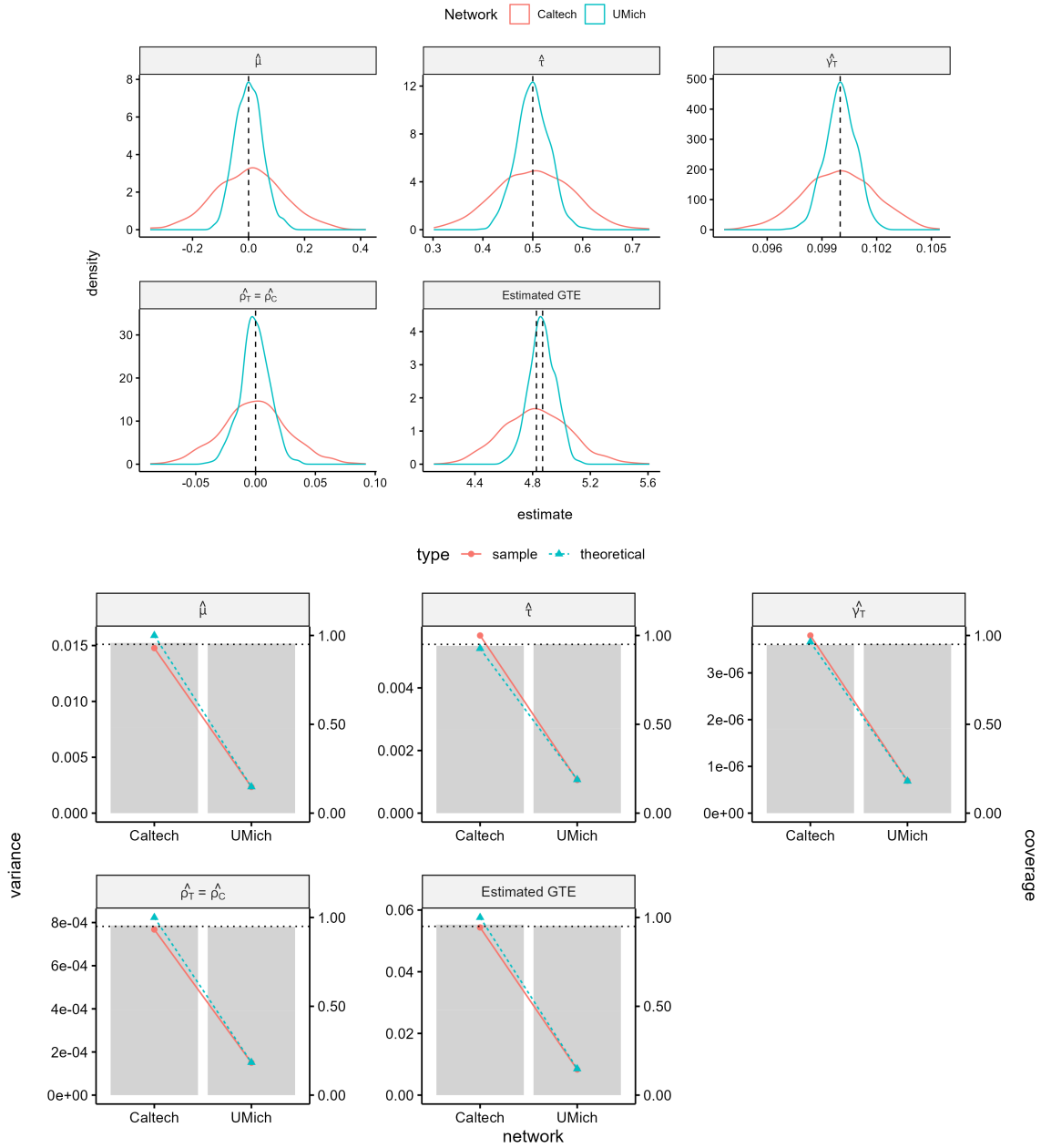


Figure S4: (upper) The distribution of parameter estimates of the HOM specification with $\mu = 0, \tau = 0.5, \gamma_T = 0.1, \rho_T = \rho_C = 0.0$ over 1,000 simulation runs. (lower) The corresponding variances of the estimates (left axes, lines) and coverage rates (right axes, bars).

S2 Additional Simulation Results for Section 4.2

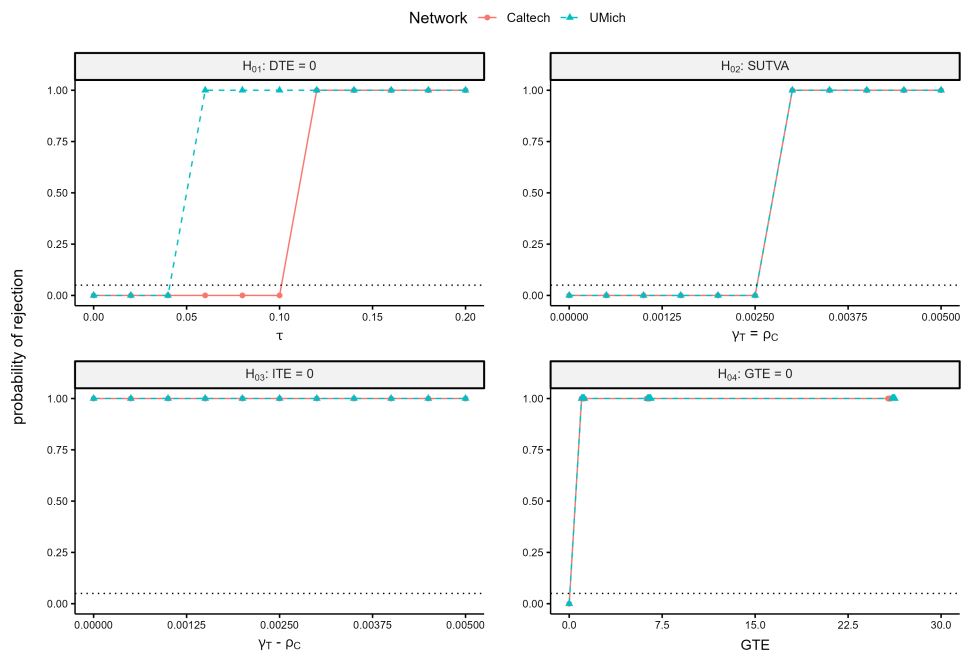


Figure S5: Rejection rates of hypothesis tests for HOM specification on the Caltech and UMich Facebook networks with varying parameters.

S3 Additional Simulation Results for Section 4.4

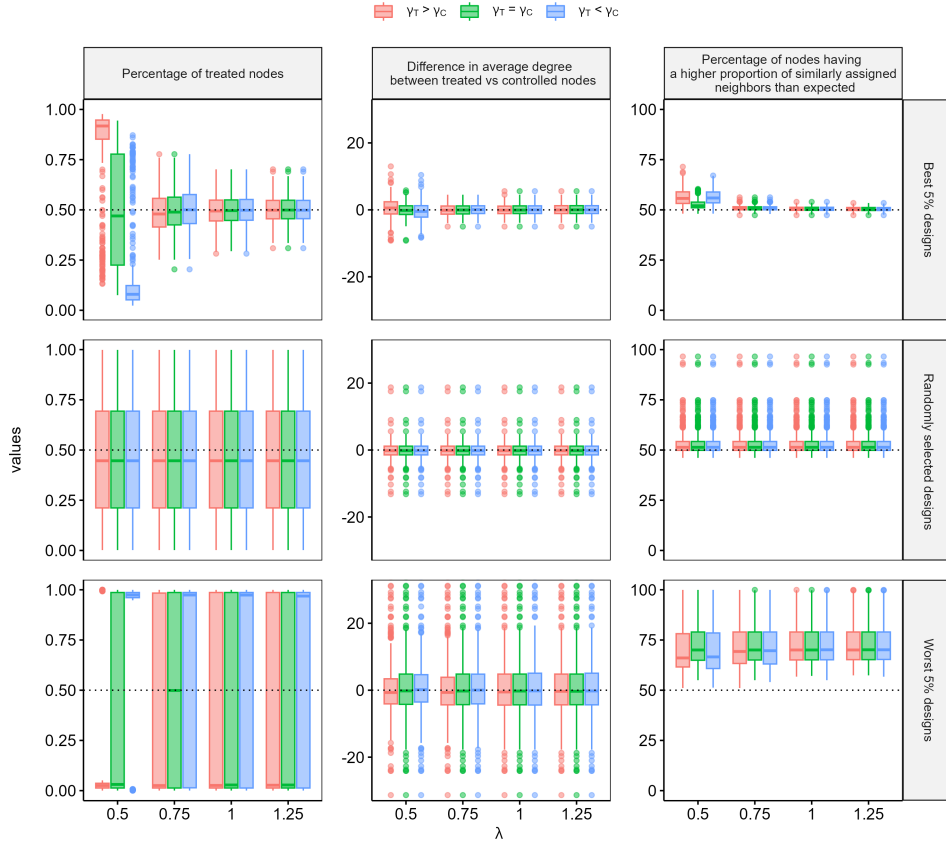


Figure S6: Characteristics of “best” 5%, randomly selected and “worst” 5% designs with respect to variance of estimated global treatment effect on the UMich Facebook network.

Designs	λ	0.5	0.75	1.00	1.75
Best 500 designs	$\gamma_T > \gamma_C$	1.372	1.9021	4.6065	21.2130
	$\gamma_T = \gamma_C$	1.1848	1.6920	4.3628	20.9454
	$\gamma_T < \gamma_C$	1.3647	1.8508	4.5280	21.1001
Worst 500 designs	$\gamma_T > \gamma_C$	0.1820	0.0807	0.0278	0.0145
	$\gamma_T = \gamma_C$	0.2711	0.0815	0.0267	0.0143
	$\gamma_T < \gamma_C$	0.1822	0.0789	0.0274	0.0144

Table 1: Efficiency in terms of $\text{Var}[\widehat{\text{GTE}}]$ of the top and bottom 500 designs selected from 10,000 randomly generated designs compared to 500 randomly generated designs on the UMich Facebook network