Supplemental material

Illustrative example using JAGS

Table S1

Illustrative example results from the three approaches

Parameters	True Value	One-step DSEM	Two-step (AUX) DSEM	Two-step (no AUX) DSEM
a_1 (μ on X)	0.40	**0.393 (0.308, 0.477)**	**0.379 (0.292, 0.467)**	**0.379 (0.294, 0.464)**
a_2 (ϕ on X)	0.10	**0.091 (0.060, 0.122)**	**0.086 (0.054, 0.118)**	**0.078 (0.049, 0.106)**
a_3 (π on X)	0.55	**0.522 (0.379, 0.654)**	**0.523 (0.386, 0.66)**	**0.515 (0.379, 0.651)**
b_1 (Y on μ)	0.40	**0.343 (0.217, 0.466)**	**0.334 (0.202, 0.465)**	**0.320 (0.188, 0.452)**
b_2 (Y on ϕ)	1.20	**1.242 (0.713, 1.744)**	**1.133 (0.638, 1.629)**	**0.871 (0.387, 1.356)**
b_3 (Y on π)	0.20	**0.198 (0.121, 0.287)**	**0.204 (0.121, 0.287)**	**0.192 (0.111, 0.274)**
c' (Y on X)	0.05	0.062 (-0.056, 0.175)	0.082 (-0.038, 0.203)	**0.125 (0.010, 0.240)**
a_1b_1(IndEff through μ)	0.16	**0.134 (0.074, 0.187)**	**0.127 (0.067, 0.186)**	**0.121 (0.064, 0.178)**
a_2b_2 (IndEff through ϕ)	0.12	**0.111 (0.054, 0.176)**	**0.098 (0.039, 0.157)**	**0.068 (0.022, 0.113)**
a_3b_3 (IndEff through π)	0.11	**0.102 (0.054, 0.154)**	**0.107 (0.055, 0.158)**	**0.099 (0.050, 0.148)**

Note. μ : intraindividual mean; ϕ : AR(1) coefficient or inertia; π : log-transformed shock variance. X: predictor; Y: outcome. IndEff: indirect effect. Values outside the parentheses were point estimates and values inside the parentheses were 95% credible or confidence interval estimates. CIs that do not cover zero were bold.

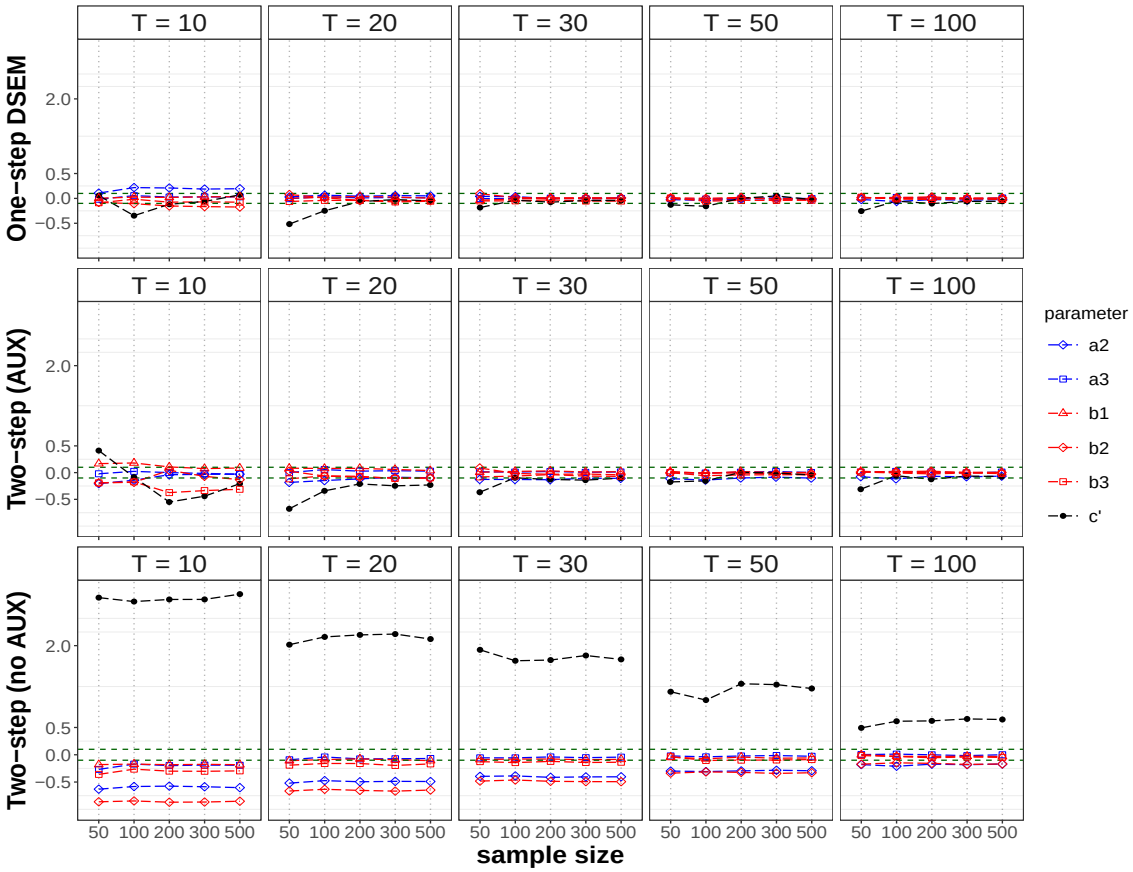
Results from other effect size conditions

1. $a_1 = 0$

True values: $a_1 = 0, a_2 = .1, a_3 = .55, b_1 = .4, b_2 = 1.2, b_3 = .2, c' = .05$

Figure S1

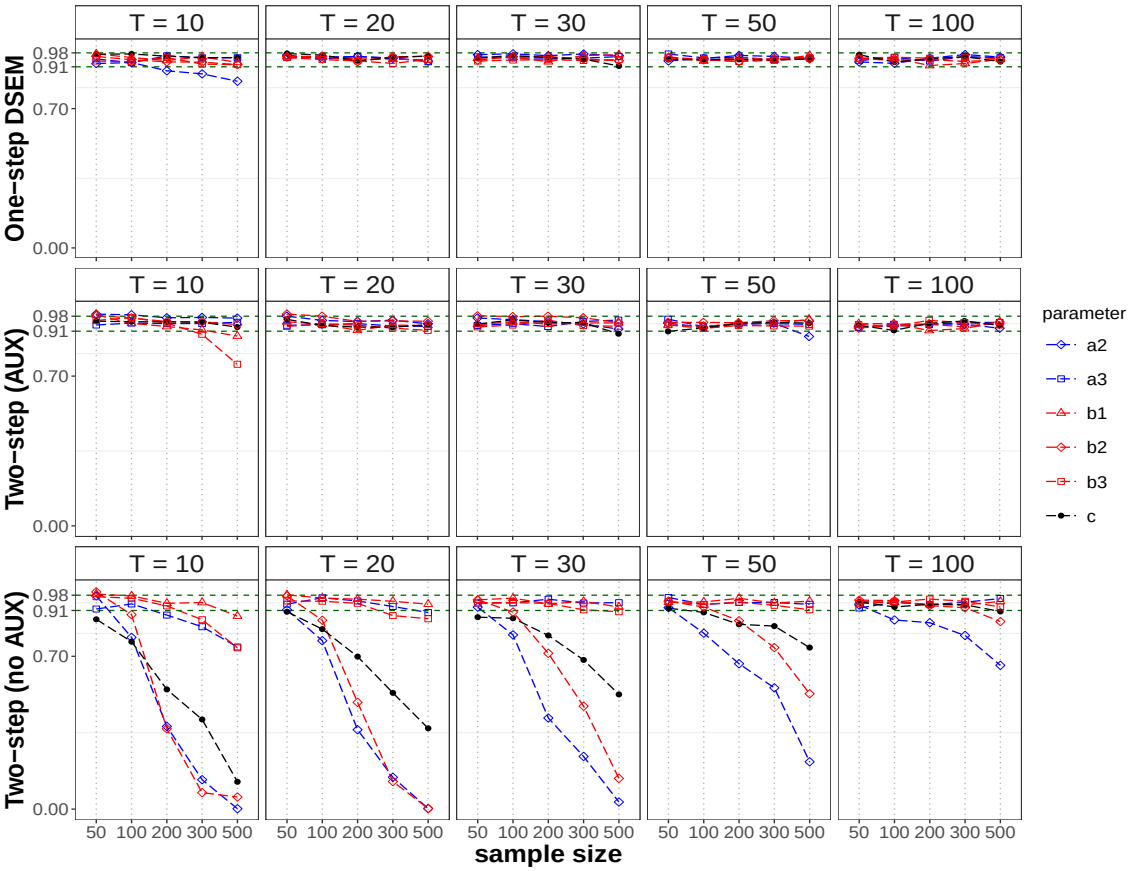
Relative bias results of $a_1, a_2, b_1, b_2, b_3, c'$ from conditions with $a_1 = 0$



Note. The green dashed lines mark the range of $[-.1, .1]$ for ignorable relative biases.

Figure S2

Coverage rates results of $a_1, a_2, b_1, b_2, b_3, c'$ *from conditions with* $a_1 = 0$



Note. The green dashed lines mark the range of $[.91, .98]$ for satisfactory 95% CI coverage rates.

Figure S3

Empirical bias results of a_1 from conditions with $a_1 = 0$

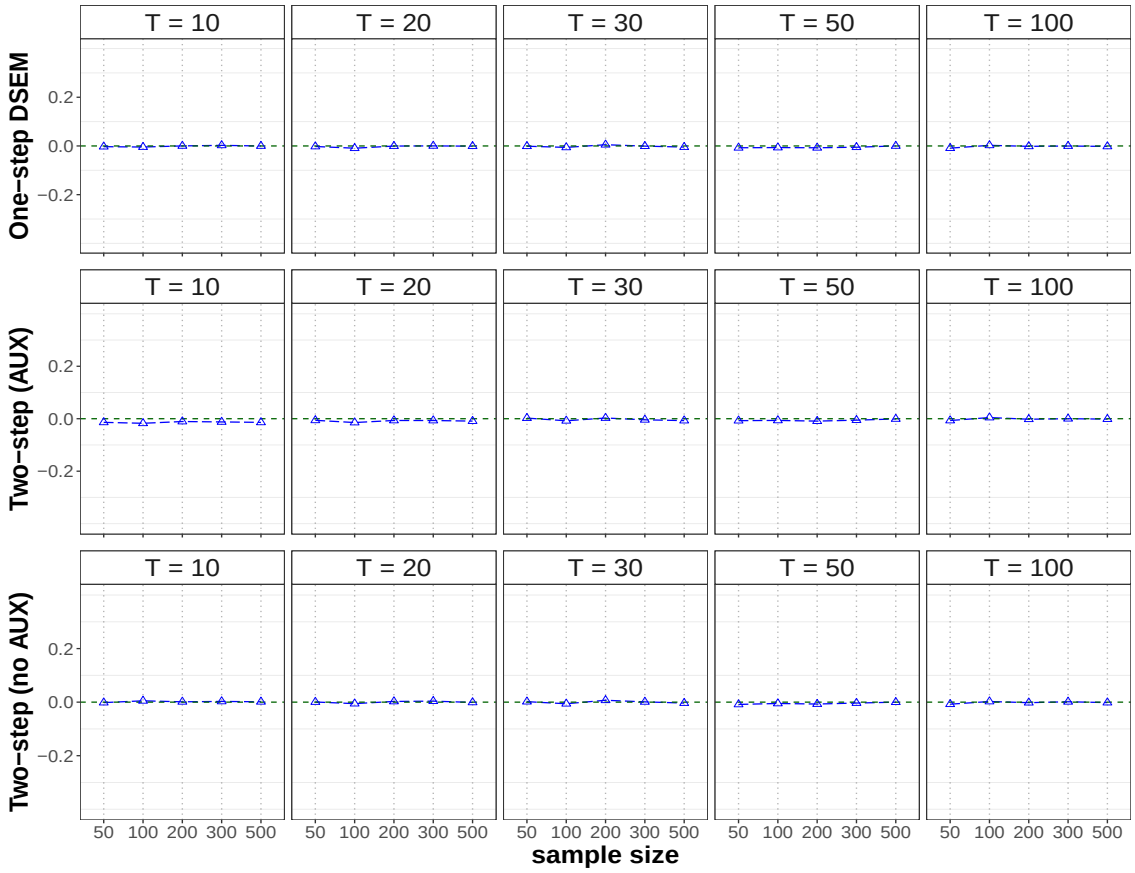
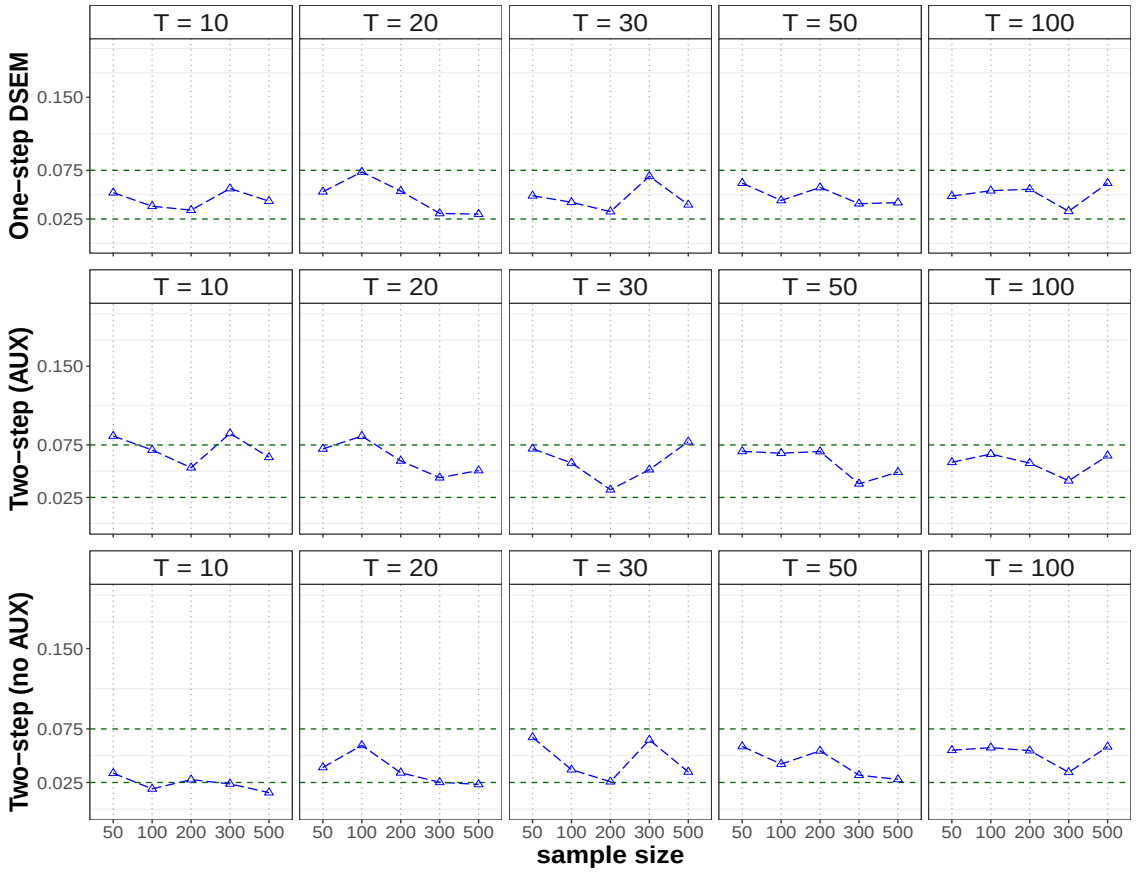


Figure S4

Type I error rate results of a_1 from conditions with $a_1 = 0$



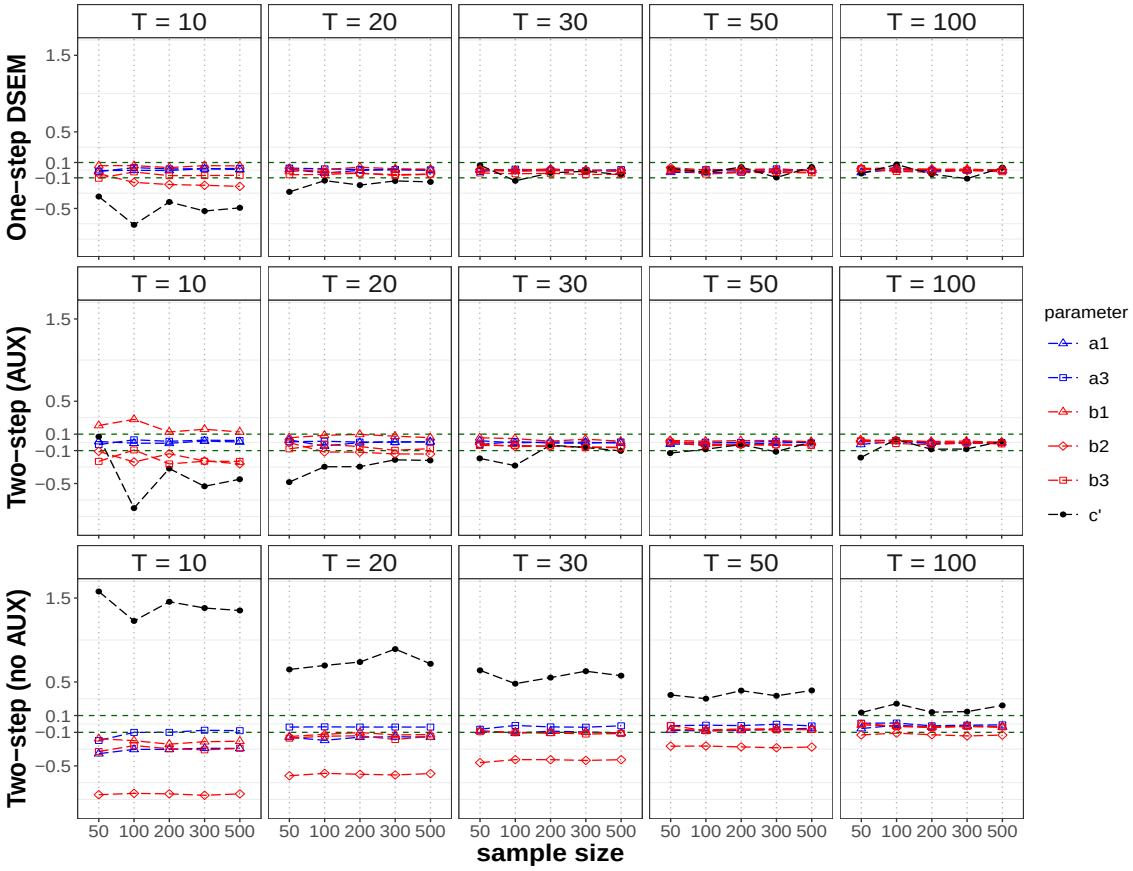
Note. The green dashed lines mark the range of $[.025, .075]$ for well-controlled Type I error rates.

2. $a_2 = 0$

True values: $a_1 = .3, a_2 = 0, a_3 = .55, b_1 = .4, b_2 = 1.2, b_3 = .2, c' = .05$

Figure S5

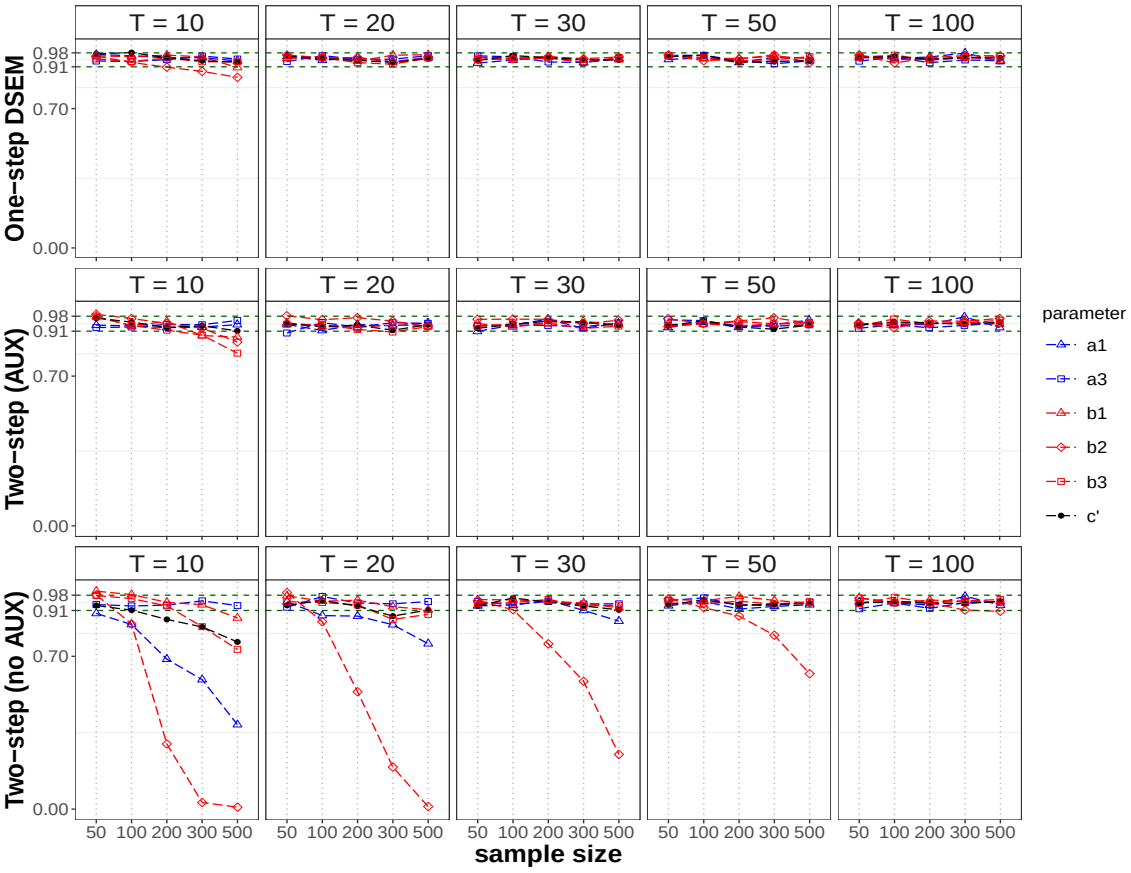
Relative bias results of $a_1, a_3, b_1, b_2, b_3, c'$ from conditions with $a_2 = 0$



Note. The green dashed lines mark the range of $[-.1, .1]$ for ignorable relative biases.

Figure S6

Coverage rates results of $a_1, a_3, b_1, b_2, b_3, c'$ *from conditions with* $a_2 = 0$



Note. The green dashed lines mark the range of $[.91, .98]$ for satisfactory 95% CI coverage rates.

Figure S7

Empirical bias results of a_2 from conditions with $a_2 = 0$

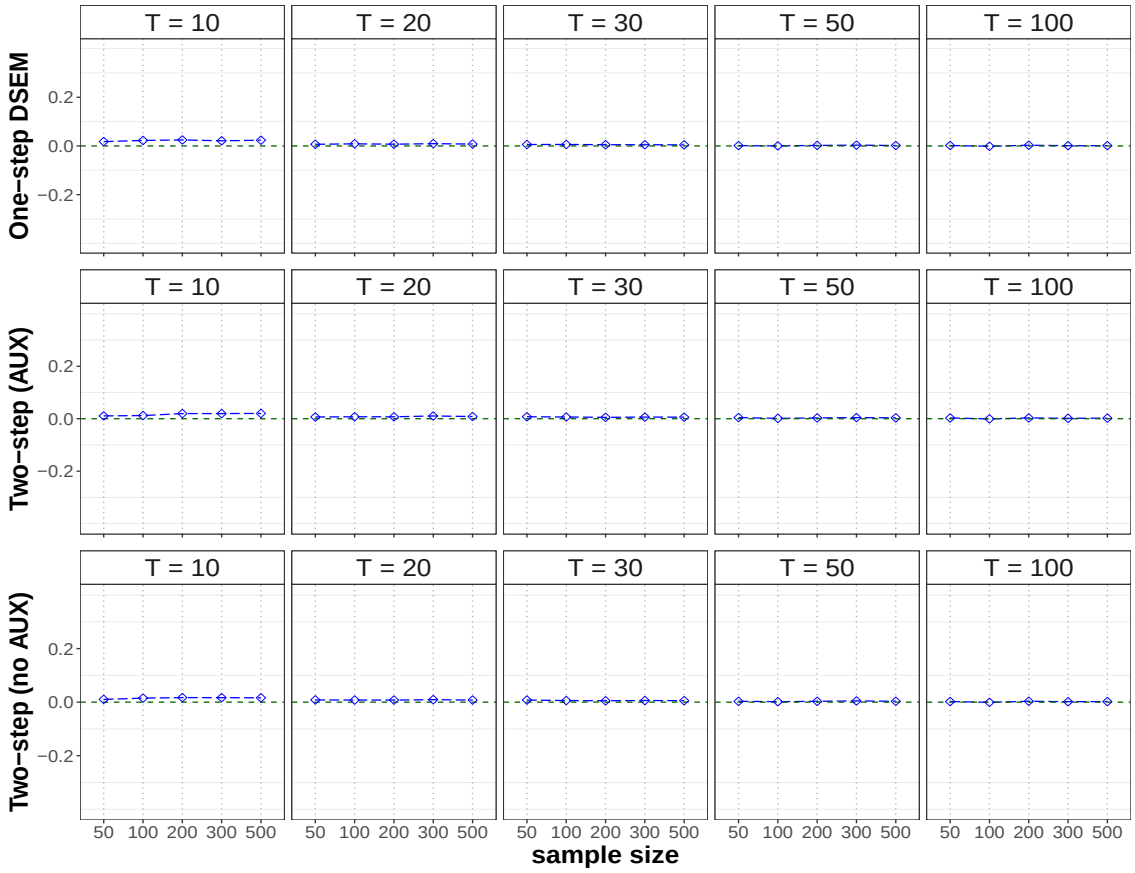
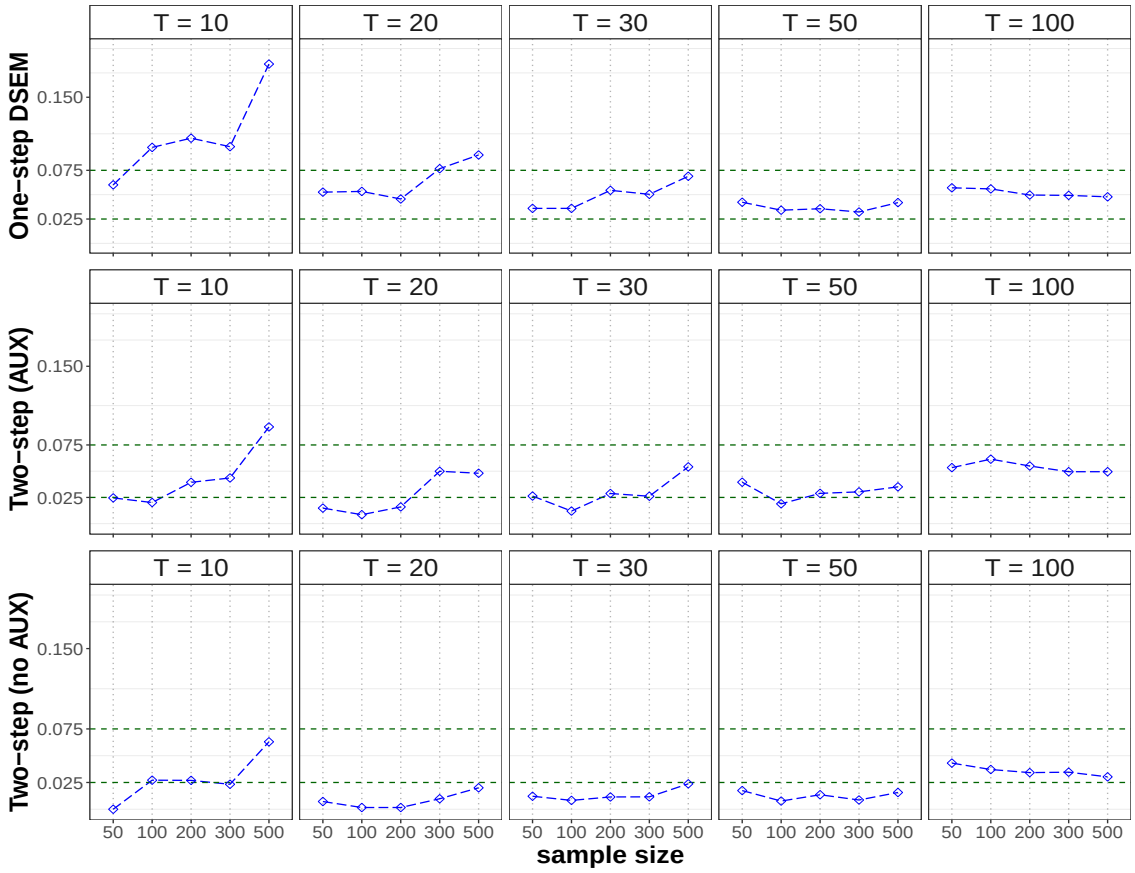


Figure S8

Type I error rate results of a_2 from conditions with $a_2 = 0$



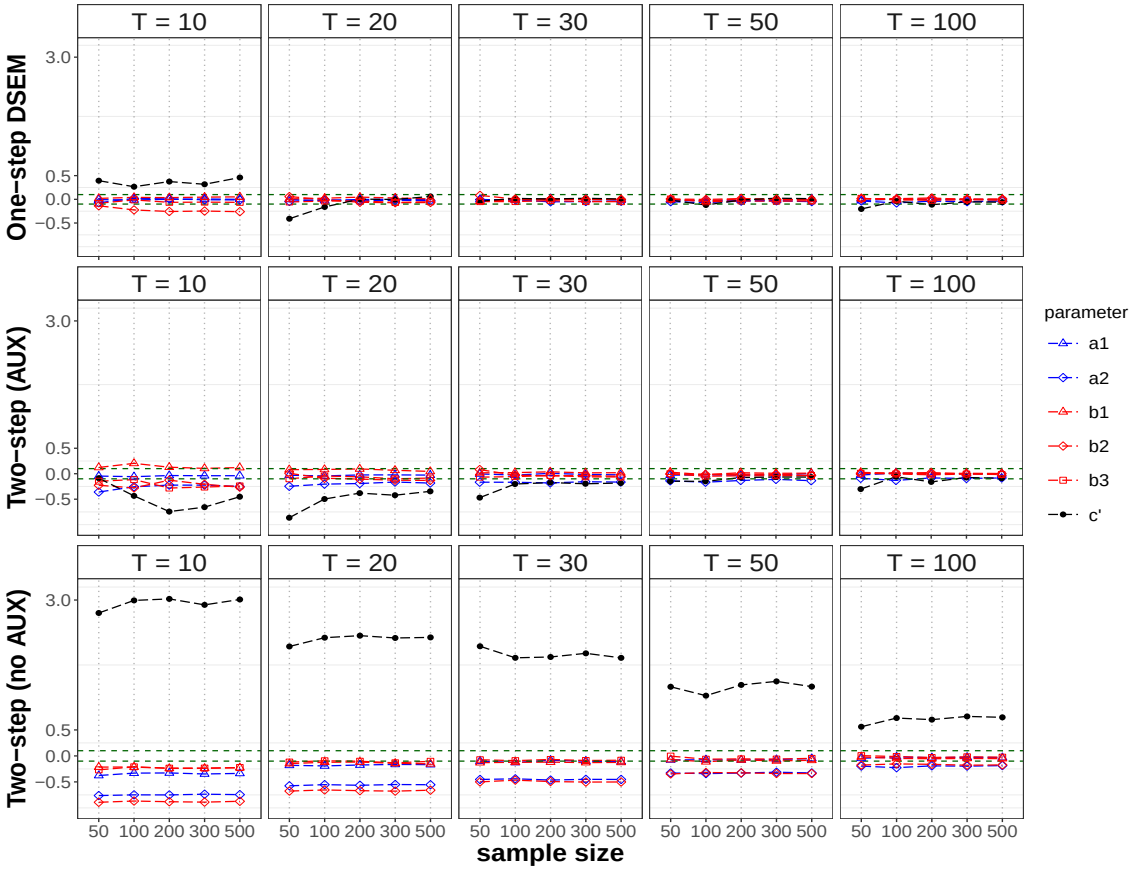
Note. The green dashed lines mark the range of $[.025, .075]$ for well-controlled Type I error rates.

3. $a_3 = 0$

True values: $a_1 = .3, a_2 = .1, a_3 = 0, b_1 = .4, b_2 = 1.2, b_3 = .2, c' = .05$

Figure S9

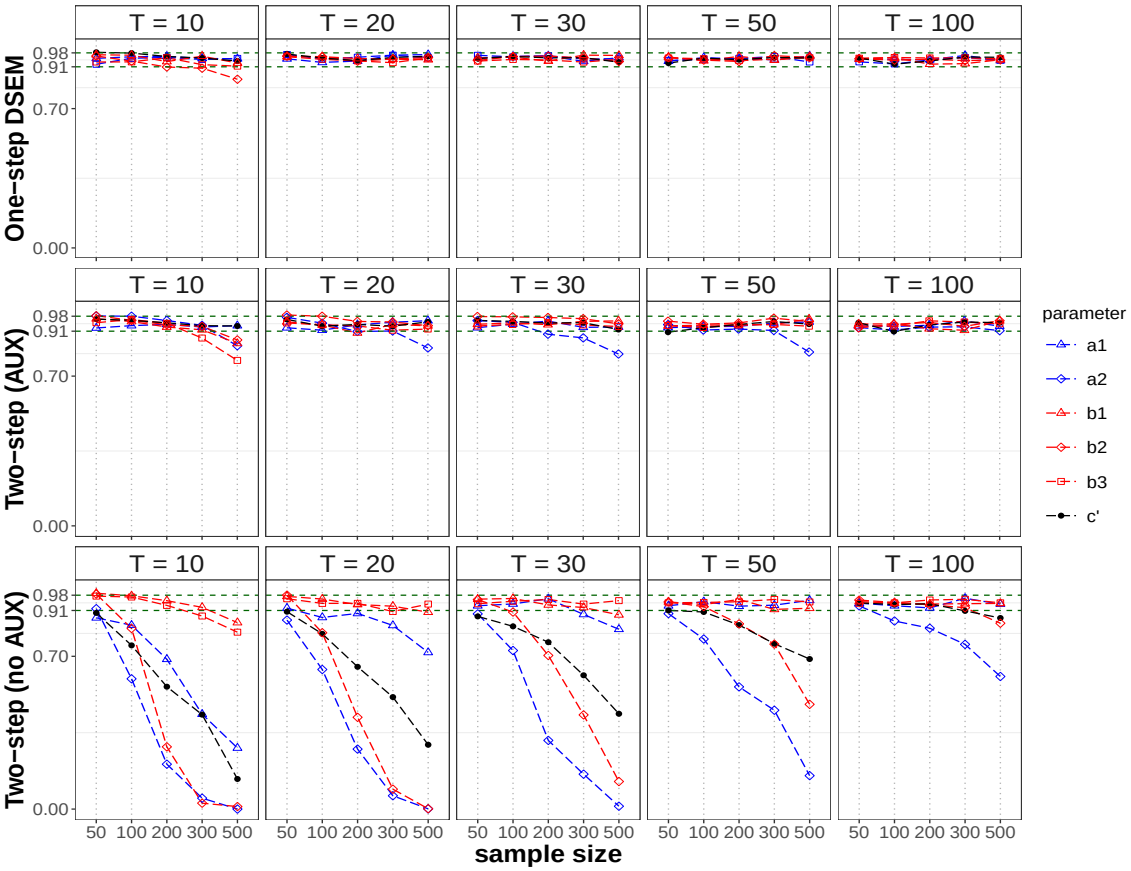
Relative bias results of $a_1, a_2, b_1, b_2, b_3, c'$ from conditions with $a_3 = 0$



Note. The green dashed lines mark the range of $[-.1, .1]$ for ignorable relative biases.

Figure S10

Coverage rates results of $a_1, a_2, b_1, b_2, b_3, c'$ *from conditions with* $a_3 = 0$



Note. The green dashed lines mark the range of $[.91, .98]$ for satisfactory 95% CI coverage rates.

Figure S11

Empirical bias results of a_3 from conditions with $a_3 = 0$

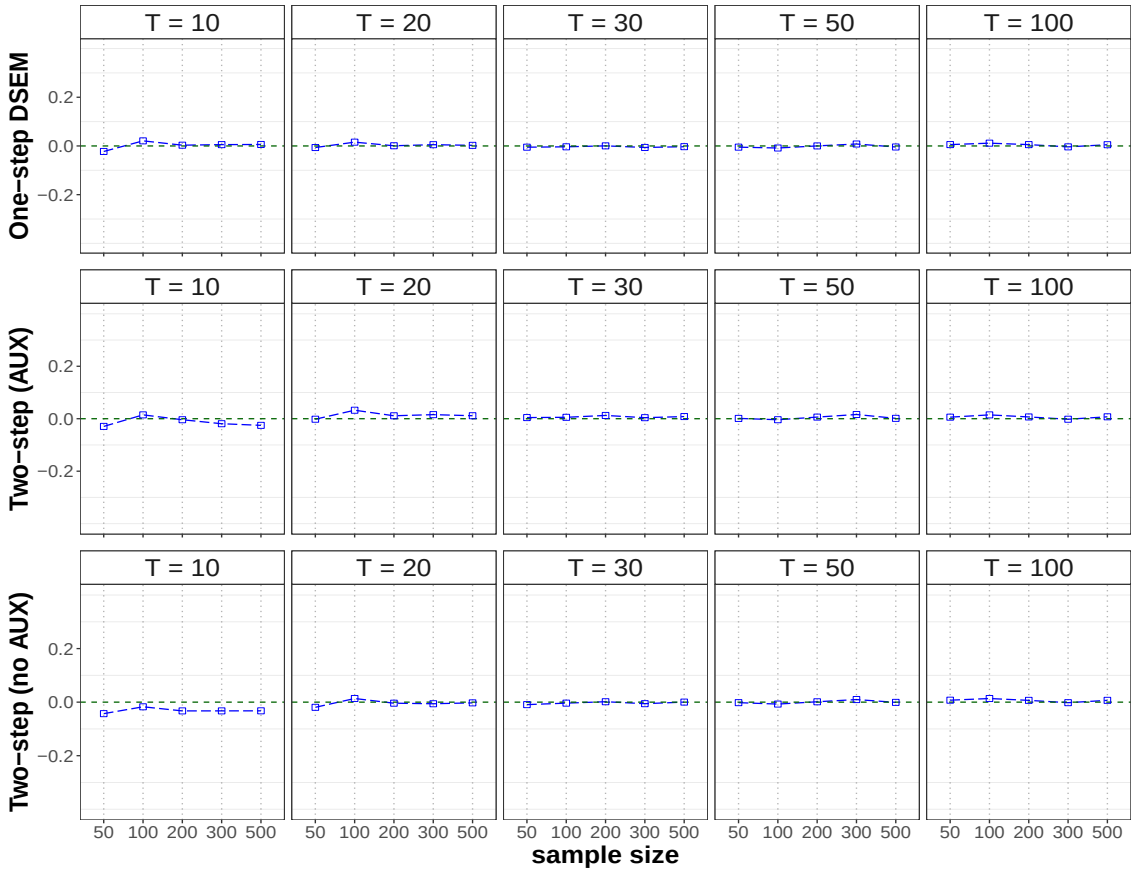
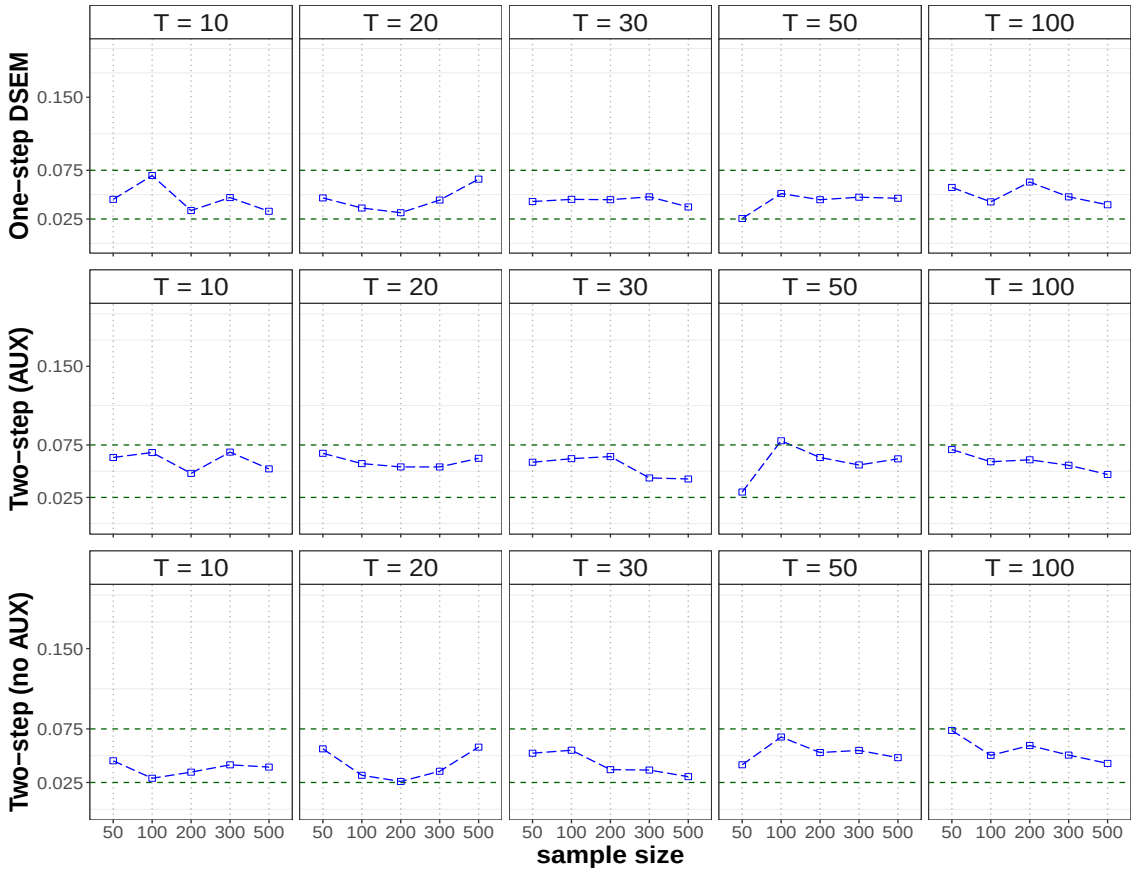


Figure S12

Type I error rate results of a_3 from conditions with $a_3 = 0$



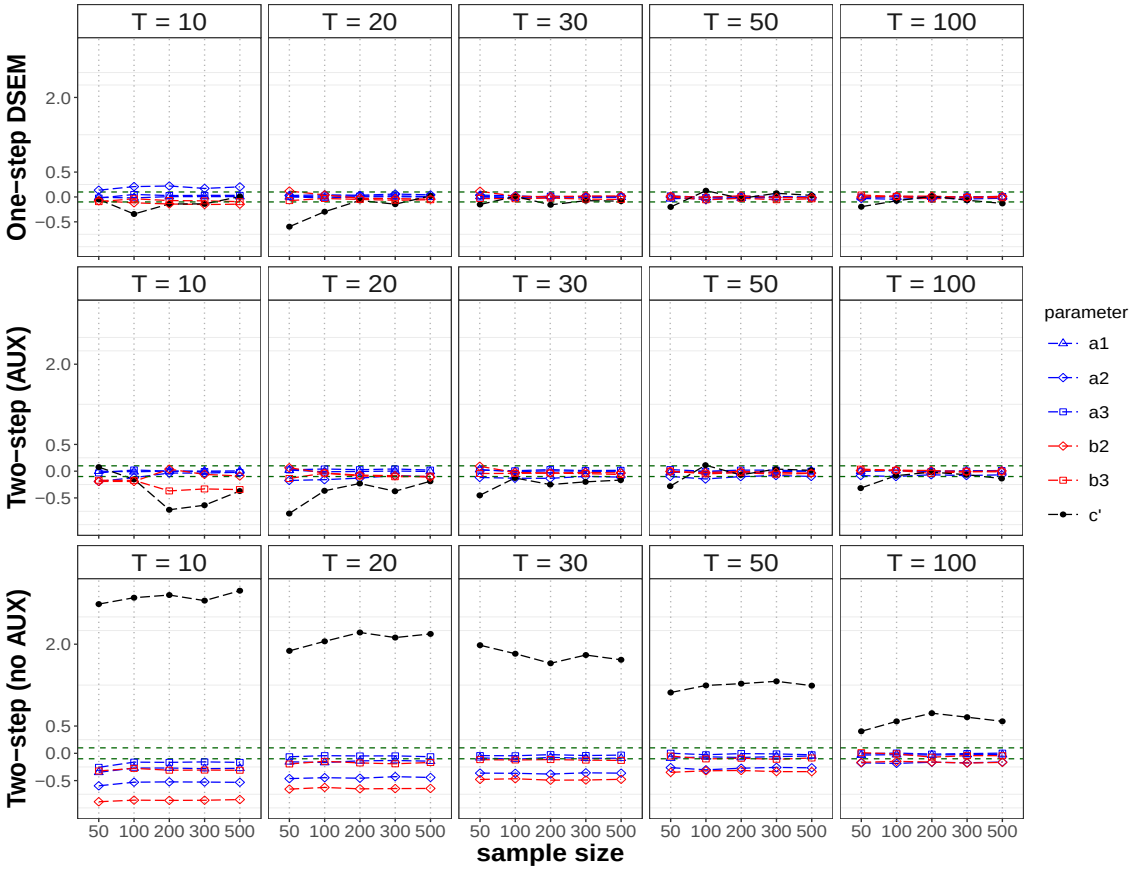
Note. The green dashed lines mark the range of $[.025, .075]$ for well-controlled Type I error rates.

4. $b_1 = 0$

True values: $a_1 = .3, a_2 = .1, a_3 = .55, b_1 = 0, b_2 = 1.2, b_3 = .2, c' = .05$

Figure S13

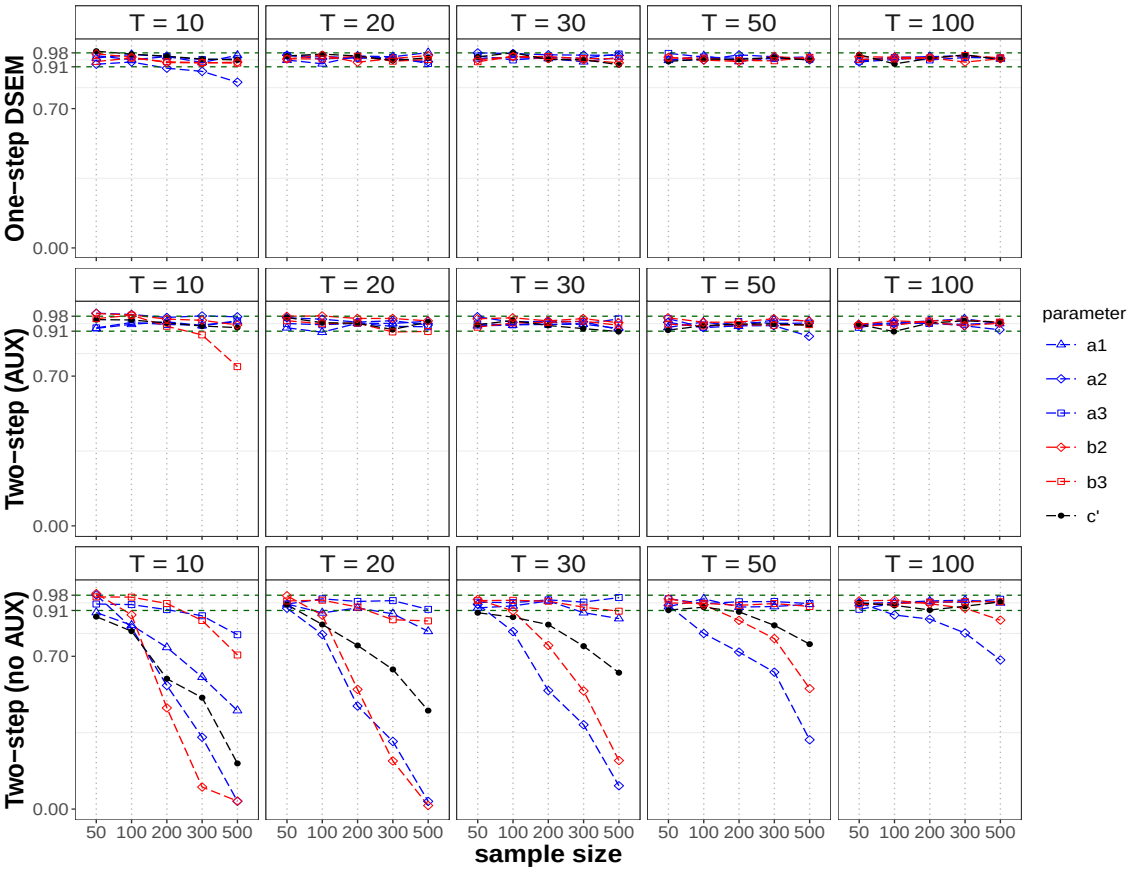
Relative bias results of $a_1, a_2, a_3, b_2, b_3, c'$ from conditions with $b_1 = 0$



Note. The green dashed lines mark the range of $[-.1, .1]$ for ignorable relative biases.

Figure S14

Coverage rates results of $a_1, a_2, a_3, b_2, b_3, c'$ *from conditions with* $b_1 = 0$



Note. The green dashed lines mark the range of $[.91, .98]$ for satisfactory 95% CI coverage rates.

Figure S15

Empirical bias results of b_1 from conditions with $b_1 = 0$

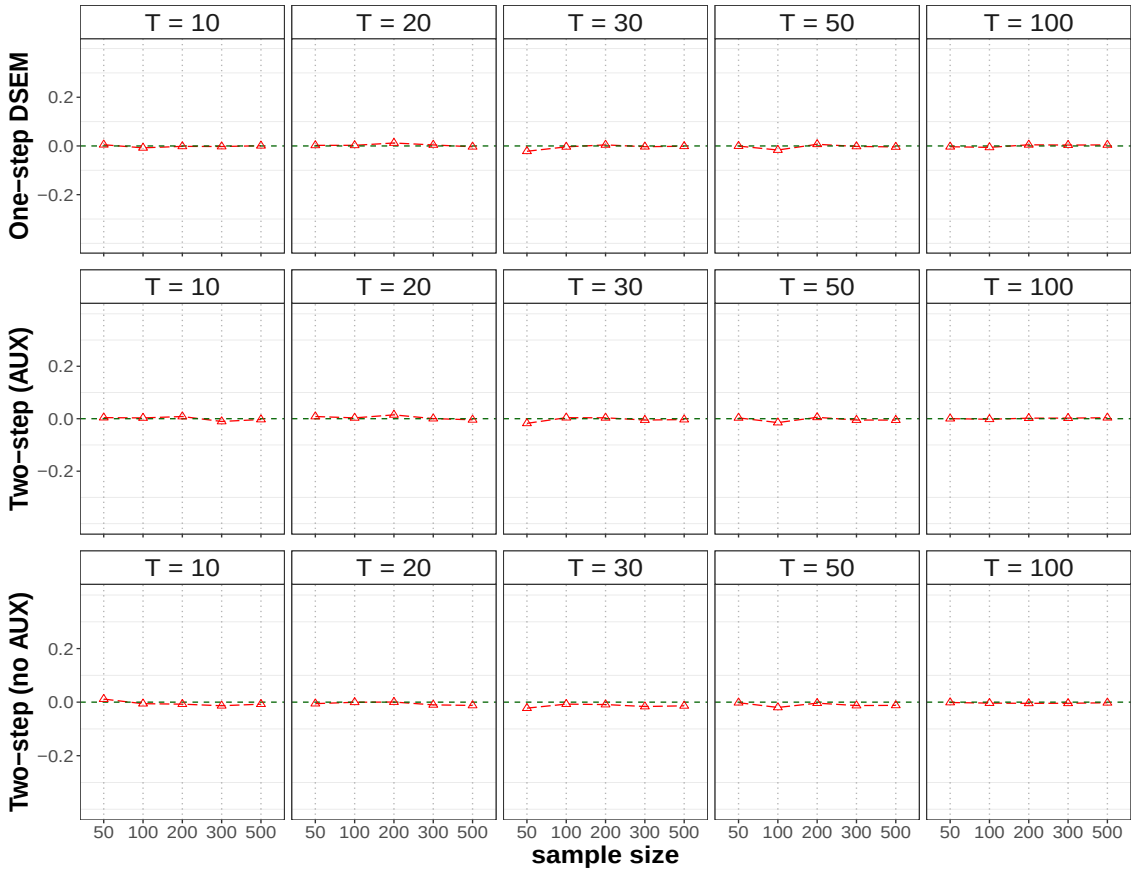
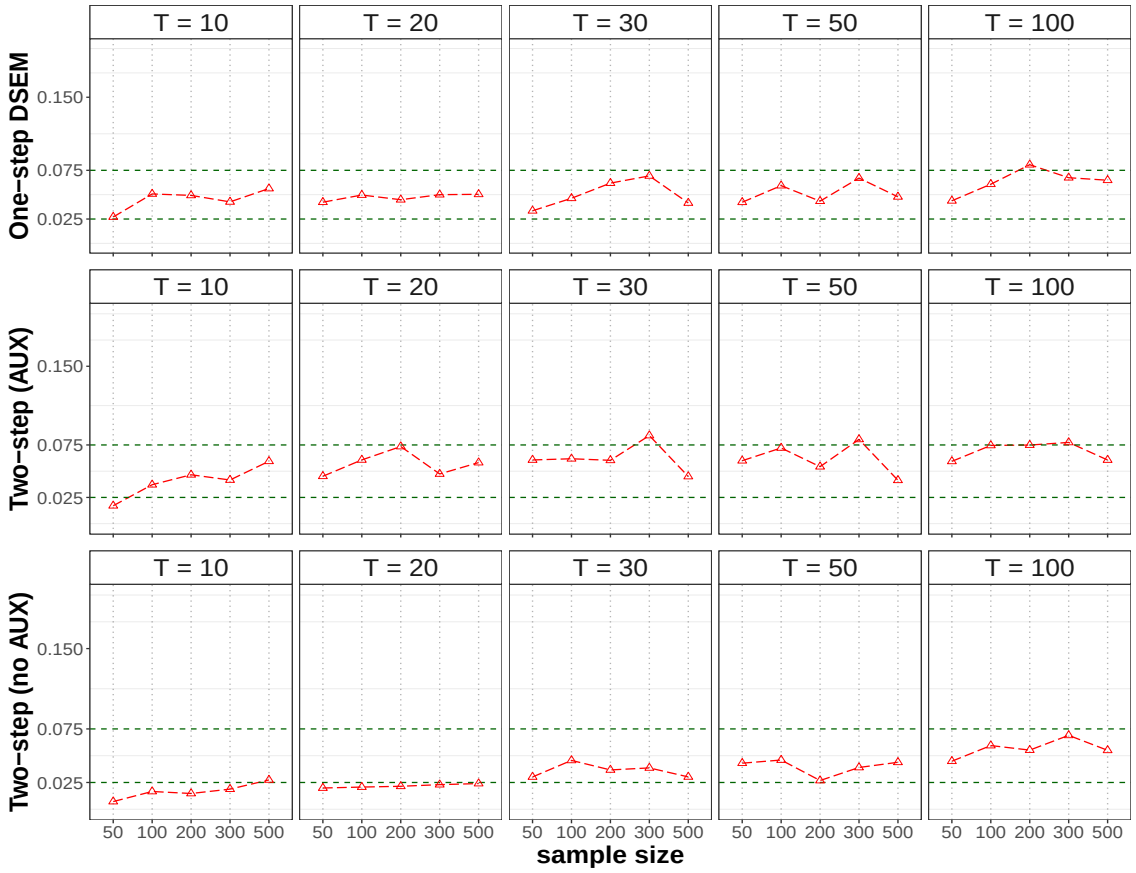


Figure S16

Type I error rate results of b_1 from conditions with $b_1 = 0$



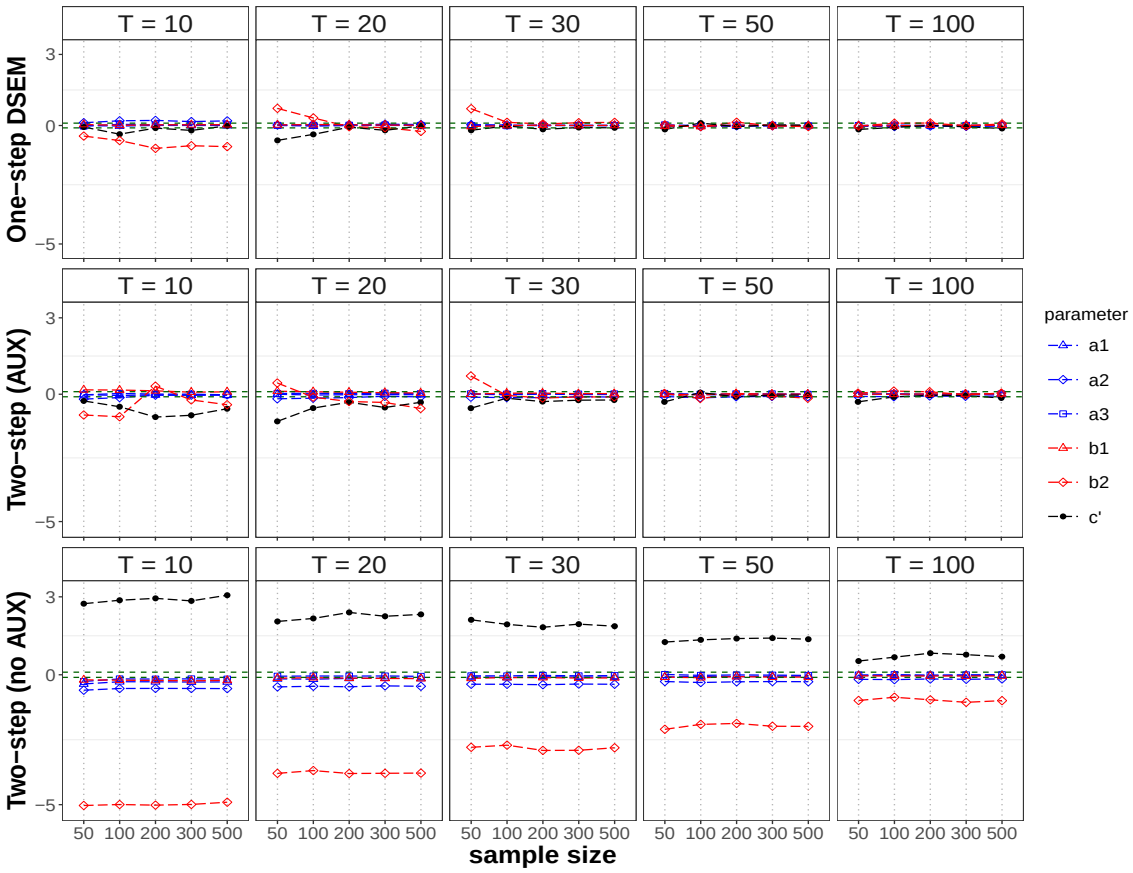
Note. The green dashed lines mark the range of $[.025, .075]$ for well-controlled Type I error rates.

5. $b_3 = 0$

True values: $a_1 = .3, a_2 = .1, a_3 = .55, b_1 = .4, b_2 = 1.2, b_3 = 0, c' = .05$

Figure S17

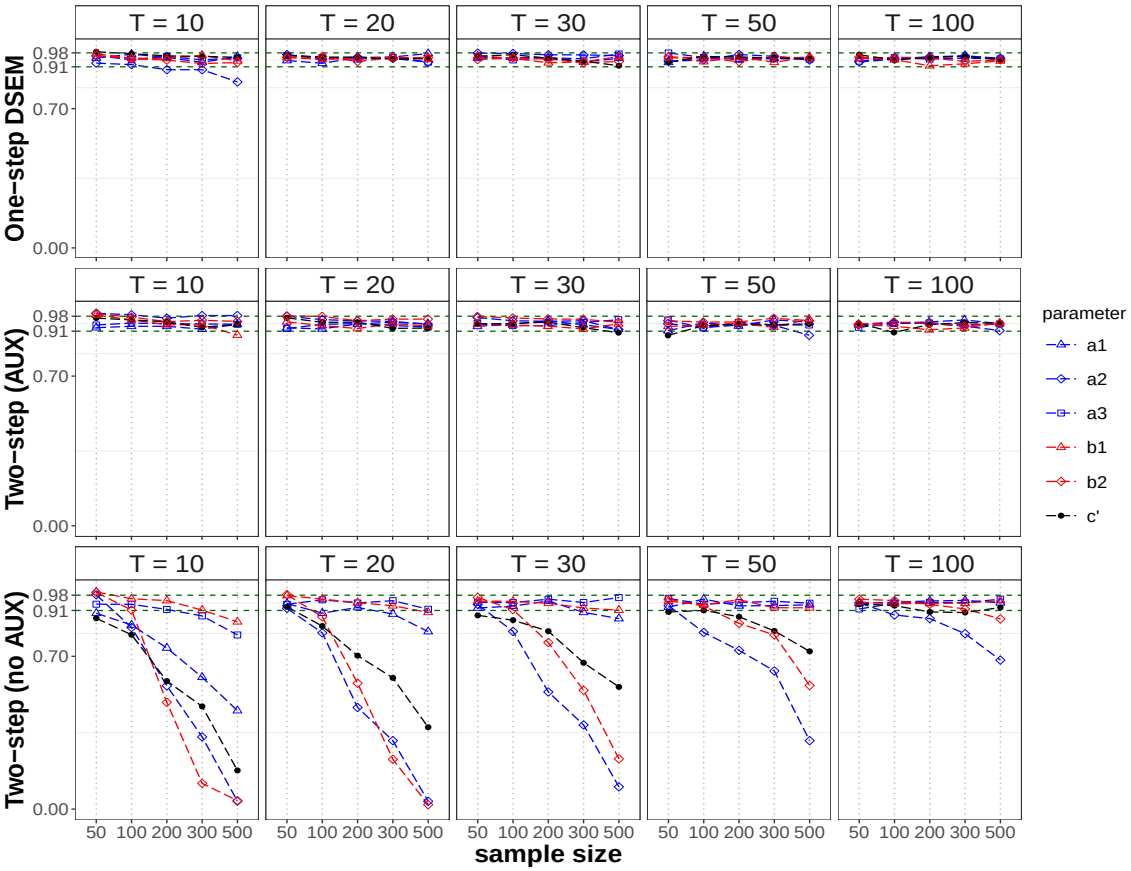
Relative bias results of $a_1, a_2, a_3, b_1, b_2, c'$ from conditions with $b_3 = 0$



Note. The green dashed lines mark the range of $[-.1, .1]$ for ignorable relative biases.

Figure S18

Coverage rates results of $a_1, a_2, a_3, b_1, b_2, c'$ *from conditions with* $b_3 = 0$



Note. The green dashed lines mark the range of $[.91, .98]$ for satisfactory 95% CI coverage rates.

Figure S19

Empirical bias results of b_3 from conditions with $b_3 = 0$

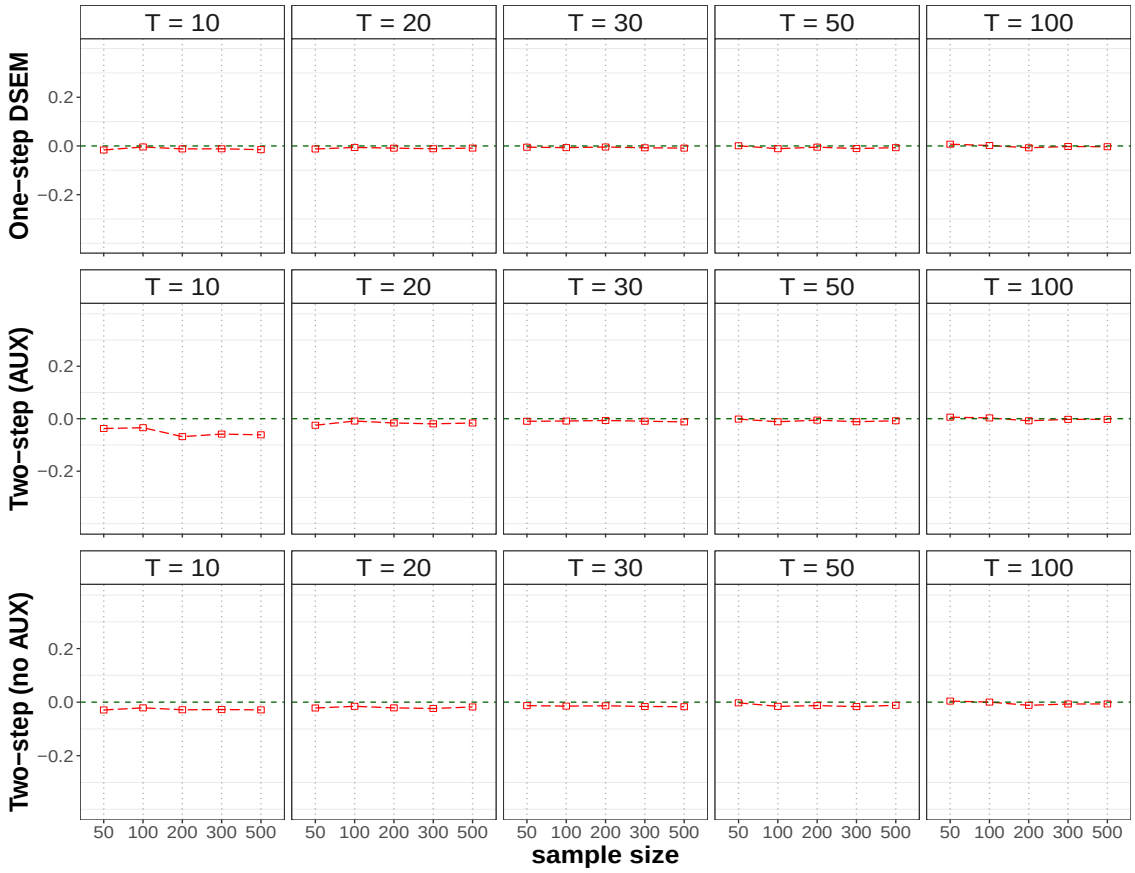
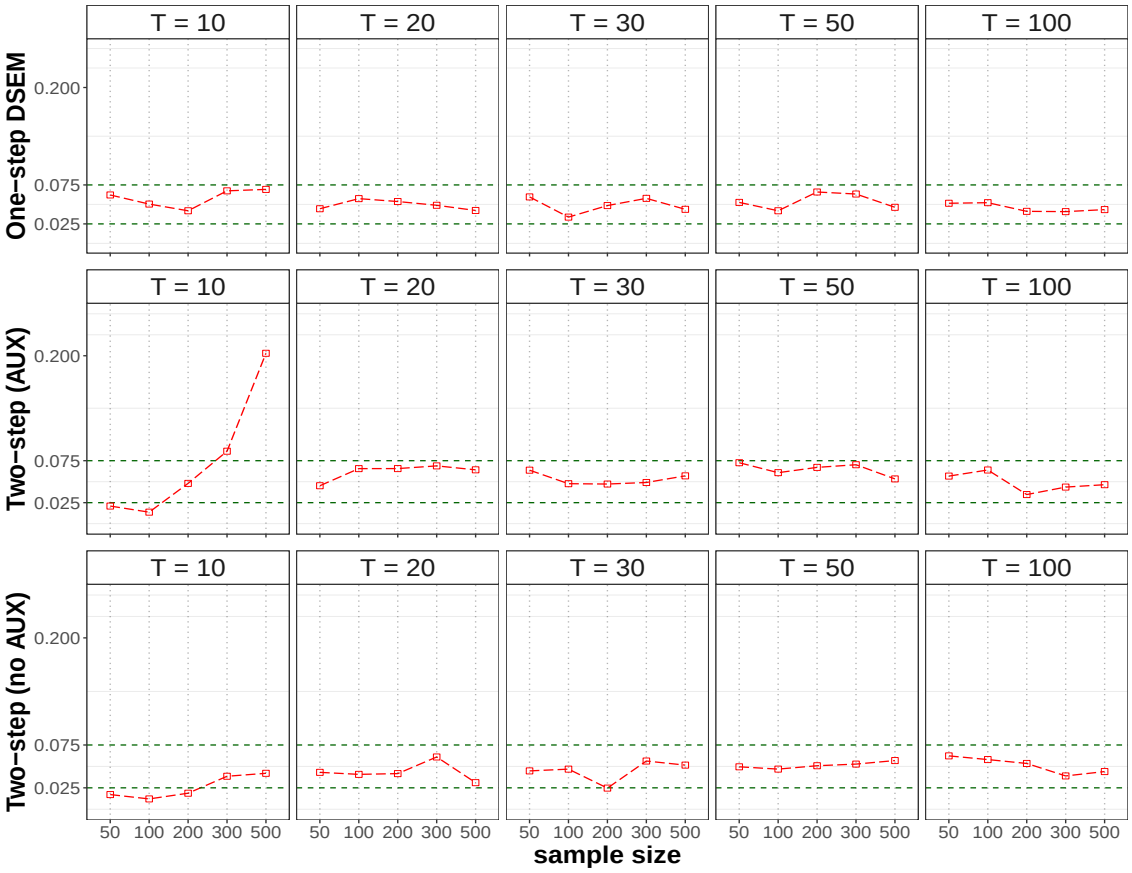


Figure S20

Type I error rate results of b_3 from conditions with $b_3 = 0$



Note. The green dashed lines mark the range of $[.025, .075]$ for well-controlled Type I error rates.