Supplementary Material for

Sample size considerations for comparing dynamic treatment regimens in a sequential multiple-assignment randomized trial with a continuous longitudinal outcome

July 12, 2019

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S1 Example Saturated Marginal Structural Mean Models

We present three generic, saturated models for each of designs I to III. Here, "saturated" means that we model one mean per DTR per stage.

For design I, a saturated marginal structural mean model is of the form

$$\begin{aligned}\mu_t^{(a_1,a_{2R},a_{2NR})}(\boldsymbol{X};\boldsymbol{\theta}) = \boldsymbol{\eta}^\top\boldsymbol{X} + \gamma_0 + \mathbb{1}\left\{t \le t^*\right\}(\gamma_1 t + \gamma_2 t a_1) \\ + \mathbb{1}\left\{t > t^*\right\}\big(\gamma_1 t^* + \gamma_2 t^* a_1 + \gamma_3(t-t^*) + \gamma_4(t-t^*)a_1 + \gamma_5(t-t^*)a_{2R} \\ +\gamma_6(t-t^*)a_{2NR} + \gamma_7(t-t^*)a_1 a_{2R} + \gamma_8(t-t^*)a_1 a_{2NR}\big),\end{aligned} \tag{S1}$$

where $\mathbb{1}_{\{E\}}$ is the indicator function for the event E.

For design II, a saturated marginal structural mean model is

$$\begin{aligned}\mu_t^{(a_1,a_{2R},a_{2NR})}(\boldsymbol{X};\boldsymbol{\theta}) = \boldsymbol{\eta}^\top\boldsymbol{X} + \gamma_0 + \mathbb{1}_{\{t\le t^*\}}(\gamma_1 t + \gamma_2 a_1 t) \\ + \mathbb{1}_{\{t>t^*\}}\big(\gamma_1 t^* + \gamma_2 t^* a_1 + \gamma_3(t-t^*) + \gamma_4(t-t^*)a_1 \\ +\gamma_5(t-t^*)a_{2NR} + \gamma_6(t-t^*)a_1 a_{2NR}\big).\end{aligned} \tag{S2}$$

Finally, for design III, a saturated marginal structural mean model is

$$\begin{aligned}\mu_t^{(a_1,a_{2R},a_{2NR})}(\boldsymbol{X};\boldsymbol{\theta}) = \boldsymbol{\eta}^\top\boldsymbol{X} + \gamma_0 + \mathbb{1}_{\{t\le t^*\}}(\gamma_1 t + \gamma_2 a_1 t) \\ + \mathbb{1}_{\{t>t^*\}}\big(\gamma_1 t^* + \gamma_2 t^* a_1 + \gamma_3(t-t^*) + \gamma_4(t-t^*)a_1 + \gamma_5(t-t^*)\mathbb{1}\{a_1=1\}a_{2NR}\big).\end{aligned} \tag{S3}$$

S2 Correlation Estimators

In table S1, we present estimators for within-person correlation ρ which do not assume that $\mathrm{Var}(Y_t^{(d)})$ is constant over both time and DTR.

Table S1: General correlation estimators for selected working correlation structures. $d \in \mathcal{D}$ is an embedded DTR, $W_i^{(d)}$ is shorthand for $W^{(d)}(A_{1,i}, R_i, A_{2,i})$, and $\hat{e}_{i,t}^{(d)}(\hat{\boldsymbol{\theta}})$ is the estimated residual $Y_{i,t} - \mu_t^{(d)}(\boldsymbol{X}_i;\hat{\boldsymbol{\theta}})$.

Cor. structure	$\mathrm{Cor}(Y_{t_j}^{(d)}, Y_{t_k}^{(d)})$	Estimator
AR(1)	$\begin{cases} 1 & t_j = t_k \\ \left(\rho^{(d)}\right)^{\lvert j-k\rvert} & t_j \ne t_k \end{cases}$	$\hat{\rho}^{(d)} = \frac{1}{n(T-1)}\sum_{i=1}^{n} W_i^{(d)} \sum_{m=1}^{T-1} \frac{\hat{e}_{i,t_m}^{(d)}(\hat{\boldsymbol{\theta}})\hat{e}_{i,t_{m+1}}^{(d)}(\hat{\boldsymbol{\theta}})}{\hat{\sigma}_{t_m}^{(d)}\hat{\sigma}_{t_{m+1}}^{(d)}}$
Exchangeable	$\begin{cases} 1 & t_j = t_k \\ \rho^{(d)} & t_j \ne t_k \end{cases}$	$\hat{\rho}^{(d)} = \frac{1}{n\cdot T(T-1)/2}\sum_{i=1}^{n} W_i^{(d)} \sum_{l<m} \frac{\hat{e}_{i,t_l}^{(d)}(\hat{\boldsymbol{\theta}})\hat{e}_{i,t_m}^{(d)}(\hat{\boldsymbol{\theta}})}{\hat{\sigma}_{t_l}^{(d)}\hat{\sigma}_{t_m}^{(d)}}$
Unstructured	$\begin{cases} 1 & t_j = t_k \\ \rho_{t_j,t_k}^{(d)} & t_j \ne t_k \end{cases}$	$\hat{\rho}_{t_j,t_k}^{(d)} = \frac{1}{n}\sum_{i=1}^{n} W_i^{(d)} \frac{\hat{e}_{i,t_j}^{(d)}(\hat{\boldsymbol{\theta}})\hat{e}_{i,t_k}^{(d)}(\hat{\boldsymbol{\theta}})}{\hat{\sigma}_{t_j}^{(d)}\hat{\sigma}_{t_k}^{(d)}}$

S3 Asymptotic Results

We show that $\hat{\boldsymbol{\theta}}$, the solution to equation (4) over $\boldsymbol{\theta}$, is asymptotically consistent for $\boldsymbol{\theta}^*$, the true regression parameter.

Define $\hat{\boldsymbol{\theta}}_n$ to be the solution of the estimating equations

$$\mathbf{0} = \frac{1}{n} \sum_{i=1}^{n} \sum_{d \in \mathcal{D}} \left[W^{(d)} \left(A_{1,i}, R_i, A_{2,i} \right) \cdot \boldsymbol{D}^{(d)}(\boldsymbol{X}_i)^\top \boldsymbol{V}^{(d)}(\boldsymbol{X}_i; \boldsymbol{\tau})^{-1} \left(\boldsymbol{Y}_i - \boldsymbol{\mu}^{(d)}(\boldsymbol{X}_i; \boldsymbol{\theta}) \right) \right] \quad \text{((4) revisited)}$$

using data from n individuals. Let $\boldsymbol{Z}_i$ contain the ith individual's observed covariates (including outcome, treatment assignments, etc.). We can re-write equation (4) as

$$\mathbf{0} = \Psi_n(\boldsymbol{\theta}) = \frac{1}{n} \sum_{i=1}^{n} \psi_{\boldsymbol{\theta}}(\boldsymbol{Z}_i), \tag{S4}$$

where

$$\psi_{\boldsymbol{\theta}}(\boldsymbol{Z}_i) = \sum_{d \in \mathcal{D}} W^{(d)} \left(A_{1,i}, R_i, A_{2,i} \right) \cdot \boldsymbol{D}^{(d)}(\boldsymbol{X}_i)^\top \boldsymbol{V}^{(d)}(\boldsymbol{X}_i; \boldsymbol{\tau})^{-1} \left(\boldsymbol{Y}_i - \boldsymbol{\mu}^{(d)}(\boldsymbol{X}_i; \boldsymbol{\theta}) \right).$$

Let $\hat{\boldsymbol{\theta}}_n$ be a solution to equation (S4) for given n, and define $\boldsymbol{\theta}^*$ as the true parameter value, such that $\boldsymbol{\theta}^*$ is a zero of $\Psi(\boldsymbol{\theta}) = \mathrm{E}[\psi_{\boldsymbol{\theta}}(\boldsymbol{Z})]$.

Assuming the parameter space $\boldsymbol{\Theta}$ is compact, $\sup_{\boldsymbol{\theta} \in \boldsymbol{\Theta}} \| \Psi_n(\boldsymbol{\theta}) - \Psi(\boldsymbol{\theta}) \| \xrightarrow{p} 0$ by the weak law of large numbers for random functions. If the model $\boldsymbol{\mu}^{(d)}(\boldsymbol{X}_i; \boldsymbol{\theta})$ is correctly specified and $\boldsymbol{\theta}^*$ is the unique solution of $\Psi(\boldsymbol{\theta}) = \mathrm{E}[\psi_{\boldsymbol{\theta}}(\boldsymbol{Z})]$, then consistency follows from standard results for M-estimation of a location parameter (see, e.g., Keener [2010, theorems 9.2, 9.4, and 9.33]).

We begin establishing asymptotic normality by considering a first-order Taylor expansion of the estimating equations (4) about $\boldsymbol{\theta}^*$, assuming continuous differentiability of $\psi_{\boldsymbol{\theta}}$:

$$\mathbf{0} = \Psi_n(\hat{\boldsymbol{\theta}}_n) = \Psi_n \left(\boldsymbol{\theta}^* \right) + \Psi_n' \left(\tilde{\boldsymbol{\theta}} \right) \left(\hat{\boldsymbol{\theta}}_n - \boldsymbol{\theta}^* \right), \tag{S5}$$

where $\tilde{\boldsymbol{\theta}}$ is some intermediate value between $\hat{\boldsymbol{\theta}}_n$ and $\boldsymbol{\theta}^*$. Note that $\Psi_n' \left(\tilde{\boldsymbol{\theta}} \right)$ is a $p \times p$ matrix, where p is the dimension of $\boldsymbol{\theta}$. If $\Psi_n' \left(\tilde{\boldsymbol{\theta}} \right)$ is non-singular, equation (S5) can be re-written as

$$\sqrt{n} \left(\hat{\boldsymbol{\theta}}_n - \boldsymbol{\theta}^* \right) = -\sqrt{n} \Psi_n' \left(\tilde{\boldsymbol{\theta}} \right)^{-1} \Psi_n \left(\boldsymbol{\theta}^* \right). \tag{S6}$$

By the central limit theorem, $\sqrt{n} \Psi_n \left(\boldsymbol{\theta}^* \right) \Rightarrow \mathcal{N} \left(\mathbf{0}, \mathrm{Var}(\psi_{\boldsymbol{\theta}}(\boldsymbol{Z})) \right)$.

Under sufficient regularity conditions (see, e.g., van der Vaart [1998, theorem 5.41]), and because $\tilde{\boldsymbol{\theta}} \xrightarrow{p} \boldsymbol{\theta}^*$, we have $-\Psi_n'(\tilde{\boldsymbol{\theta}}) \xrightarrow{p} -\mathrm{E} \left[\psi_{\boldsymbol{\theta}}'(\boldsymbol{Z}) \right]$.

Define $\boldsymbol{B} = \mathrm{E} \left[\psi_{\boldsymbol{\theta}}'(\boldsymbol{Z}) \right]$ and $\boldsymbol{M} = \mathrm{Var}(\psi_{\boldsymbol{\theta}}(\boldsymbol{Z})) = \mathrm{E} \left[\psi_{\boldsymbol{\theta}}(\boldsymbol{Z})^{\otimes 2} \right]$. By Slutsky's theorem and the delta method, we have

$$\sqrt{n} \left(\hat{\boldsymbol{\theta}}_n - \boldsymbol{\theta}^* \right) \Rightarrow \mathcal{N} \left(\mathbf{0}, \boldsymbol{B}^{-1} \boldsymbol{M} \boldsymbol{B}^{-1} \right). \tag{S7}$$

This completes the proof.

S4 Sharp Sample Size Formulae

The sample size formulae developed in the main text are upper bounds on sharper formulae presented here. Working assumptions A1 and A2 are still needed to obtain these sharp formulae, as is the restriction to three timepoints and piecewise-linear models, examples of which are in section S1. These formulae arise directly from derivations as in appendix B.

Table S2: Design effects for sharp sample size formula (S8).

Design	Form of $\mathrm{DE}_{\text{sharp}}$
I	$(1-\rho^2) - \frac{(1-\rho)\rho^2}{2(1+\rho)}$
II	$\frac{(1-\rho)\left(\rho^2+4\rho-\frac{1}{2}(r_1+r_{-1})(2\rho+1)+2\right)}{1+\rho}$
III	$\frac{(1-\rho)\left(2\rho^2+(3-r_1)(1+2\rho)\right)}{2(1+\rho)}$

The sharp formulae have a similar structure to the conservative one presented in formula (10), but the usual design effect and deflation factor due to the longitudinal observations are not separable into distinct terms. Rather, the sharp formulae are expressed as follows:

$$n \geq \frac{4\left(z_{1-\alpha/2}+z_{1-\beta}\right)^2}{\delta^2} \cdot \mathrm{DE}_{\text{sharp}}, \tag{S8}$$

where DE is defined as in table S2.

Notice that for each design, $\mathrm{DE}_{\text{sharp}} \leq (1-\rho^2)\cdot \mathrm{DE}$, where $\mathrm{DE}_{\text{sharp}}$ is as defined in table 3.

S5 Additional Details Regarding the Generative Model in Appendix C

Here we provide additional technical details about the generative model presented in appendix C. In particular, we provide a more complete description of the response models R_+ and R_-, as well as details of how variance was computed so as to correctly marginalize over response status.

S5.1 Models for Response Status

Potential response status for both first-stage treatment options is generated as

$$R_i^{(a_1)} = g_{a_1}\left(Y_{1,i}^{(a_1)}\right),$$

where $g_{a_1} : \mathbb{R} \to \{0,1\}$. Define $r_{a_1} := P(R^{(a_1)} = 1)$. In table 4, we consider three possible response models. In the first, which we denote "$R_{\perp\!\!\!\perp}$", $g_{a_1}(Y_1^{(a_1)}) = X$, where $X \sim \text{Bernoulli}(r_{a_1})$ is independent of Y_0 and $Y_1^{(a_1)}$. We do not believe this is a realistic model for response; however, we consider it an important comparative scenario.

Under the second response model, "R_+", $g_{a_1}(Y_{1,i}^{(a_1)}) = X_i^{(a_1)}$, where $X_i^{(a_1)} \sim \text{Bernoulli}(r_{a_1,i}^+)$, where $r_{a_1,i}^+ = P(R_i^{(a_1)} = 1)$ increases with $Y_{1,i}^{(a_1)}$. $r_{a_1,i}^+$ are generated from a $\text{Beta}(r_{a_1}/(1-r_{a_1}), 1)$ distribution, where r_{a_1} is the desired average probability of response.

To compute $r_{a_1,i}^+$, we center and standardize $Y_{1,i}^{(a_1)}$ with respect to the (known) true mean and standard deviation, then apply an inverse-cumulative distribution function transformation:

$$r_{a_1,i}^+ = F_{a_1}^{\leftarrow}\left(\Phi\left(\frac{Y_{1,i}^{a_1} - \mu_1^{(a_1)}}{\sigma}\right)\right),$$

where $F_{a_1}^{\leftarrow}$ is the inverse CDF of the Beta$(r_{a_1}/(1-r_{a_1}),1)$ distribution. This ensures that $E[r_{a_1,i}^{+}] = r_{a_1}$, and that all response probabilities are bounded on the interval $(0,1)$.This model is designed to mimic scenarios in which the tailoring variable is closely related to Y_1 and "response" is associated with *high* values of Y_1.

Similarly, for the final response model considered in table 4, "R_{-}", $g_{a_1}(Y_{1,i}^{(a_1)}) = X_i^{(a_1)}$, where $X_i^{(a_1)} \sim$ Bernoulli$(r_{a_1,i}^{-})$, where $r_{a_1,i}^{-}$ is negatively correlated with $Y_{1,i}^{(a_1)}$:

$$r_{a_1,i}^{-} = F_{a_1}^{\leftarrow}\left(1-\Phi\left(\frac{Y_{1,i}^{a_1}-\mu_1^{(a_1)}}{\sigma}\right)\right).$$

This model is designed to mimic scenarios in which the tailoring variable is closely related to Y_1 and "response" is associated with *low* values of Y_1.

S5.2 Variance

Recall that, in our generative model, the second-stage response-conditional error $\epsilon_2^{(d)}(R^{(a_1^{(d)})})$ follows a $\mathcal{N}(0, v^{(d)}(R^{(a_1^{(d)})}))$ distribution, where

$$\begin{aligned} v^{(d)}(x) &= \mathrm{Var}\left(Y_2^{(d)} \mid R^{(a_1)} = x\right) - \mathrm{Var}\left(c_0Y_0 + c_1Y_1^{(a_1)} \mid R^{(a_1)} = x\right) \\ &= \left(\omega_x^{(d)}\right)^2 - \mathrm{Var}\left(c_0Y_0 + c_1Y_1^{(a_1)} \mid R^{(a_1)} = x\right); \end{aligned} \tag{S9}$$

$\omega_x^{(d)}$ is the standard deviation of Y_2^d given response status x. Subtracting $\mathrm{Var}\left(c_0Y_0 + c_1Y_1^{(a_1)} \mid R^{(a_1)} = x\right)$ in equation (S9) is necessary to account for the variation introduced into $Y_{2,i}^{(d)} \mid R^{(a_1)}$ by constructing it as a function of previously-observed outcomes.

By the law of total variance,

$$\sigma^2 = r_{a_1}\left(\omega_1^{(d)}\right)^2 + \left(1-r_{a_1}\right)\left(\omega_0^{(d)}\right)^2 + r_{a_1}\left(1-r_{a_1}\right)\left(\Delta_2^{(d)}\right)^2, \tag{S10}$$

where $\Delta_2^{(d)} = \mathrm{E}[Y_2^{(d)} \mid R^{(a_1)} = 1] - \mathrm{E}[Y_2^{(d)} \mid R^{(a_1)} = 0]$. There exist infinite choices of $\omega_0^{(d)}$ and $\omega_1^{(d)}$ that satisfy equation (S10). To generate data, we fix responders' variances and compute non-responders' variances by solving for $\omega_0^{(d)}$ in equation (S10) in order to achieve a given marginal variance σ^2. For designs II and III, we set the variances for all responders; for design I, without loss of generality, we fix only the variances of responders for whom $A_{2R,i} = A_{1,i}$ (i.e., boxes C and H in figure 1).

Under reasonable response-generation mechanisms (i.e., not $R_{\perp\!\!\!\perp}$), we were unable to derive closed-form expressions for $\mathrm{E}[Y_2^{(d)} \mid R^{(a_1)} = x]$ and $\mathrm{Var}(c_0Y_0 + c_1Y_1^{(a_1)} \mid R^{(a_1)} = x)$, $x = 0, 1$. As such, these values are computed numerically for each simulation scenario using a simulated data set containing 200,000 observations. These estimates are then used as the "true" values in the generative models when simulating scenarios in table 4.

As mentioned in section 5.2, the generative model described above induces bounds on the choice of $\omega_1^{(d)}$. In order to achieve $v^{(d)}(j) > 0$ for all $d \in \mathcal{D}$ and $j \in \{0,1\}$, we need

$$\begin{aligned} \left(\omega_1^{(d)}\right)^2 \geq \max\Bigg\{&\mathrm{Var}\left(c_0Y_0 + c_1Y_1^{(a_1)} \mid R^{(a_1)} = 1\right), \\ &(1-r_{a_1})\left(\left(\Delta_2^{(d')}\right)^2 - \left(\Delta_2^{(d)}\right)^2 + \mathrm{Var}\left(c_0Y_0 + c_1Y_1^{(a_1)} \mid R^{(a_1)} = 1\right)\right)\Bigg\} \end{aligned} \tag{S11}$$

and

$$\left(\omega_1^{(d)}\right)^2 \leq \frac{1}{r_{a_1}}\sigma^2 - (1-r_{a_1})\max\left\{\left(\Delta_2^{(d)}\right)^2,\ \left(\Delta_2^{(d')}\right)^2\right\} - \frac{1-r_{a_1}}{r_{a_1}}\operatorname{Var}\left(c_0 Y_0 + c_1 Y_1^{(a_1)} \mid R^{(a_1)} = 1\right), \tag{S12}$$

where , and $d' \in \mathcal{D}$ is a second DTR that recommends the same first-stage treatment as d, i.e., $a_1^{(d)} = a_1^{(d')}$. In table 4, a dagger (†) indicates that, in that scenario, we were not able to find a parameterization of the generative model in which the upper bound (S12) is larger than the lower bound (S11).

In table S3, we provide unstructured estimates of $\operatorname{Var}(Y^{(d)})$ not averaged over DTR. For designs I and III, the target structure is

$$\begin{pmatrix} 64 & 19.2 & 19.2 \\ 19.2 & 64 & 19.2 \\ 19.2 & 19.2 & 64 \end{pmatrix}.$$

For design II, the target structure is

$$\begin{pmatrix} 36 & 10.8 & 10.8 \\ 10.8 & 36 & 10.8 \\ 10.8 & 10.8 & 36 \end{pmatrix}.$$

The differences are due to how σ^2 was set to achieve a standardized effect size of $\delta = 0.3$. The true correlation is $\rho = 0.3$; the response rate is 0.4 for both first-stage treatments, and the response model used is R_+.

S6 Description of Alternative Simulation Framework

In addition to the data-generative process described in appendix C, we employ a second process to violate working assumption A1(c). When data are generated sequentially according to appendix C, we cannot derive a closed-form expression for $\operatorname{Cov}\left(Y_t^{(d)}, Y_{t_T}^{(d)} \mid R^{(a_1)}\right)$, as is required to control violation of working assumption A1(c). Therefore, in scenarios in which we violate working assumption A1(c), we use the alternative generative process described below. Note that, in this model, we by default employ the $R_{\perp\!\!\!\perp}$ definition of response.

Data were generated as follows:

1. Draw A_1 from $\{-1, 1\}$ with equal probability.
2. For each subset of participants, generate R from a Bernoulli(r_{A_1}) distribution.
3. Draw A_2 from $\{-1, 1\}$ with equal probability for those participants who are re-randomized (e.g., for all participants in design I but only for non-responders in design II).
4. For each participant, generate $\boldsymbol{Y} \in \mathbb{R}^{T\times 1}$ such that $\boldsymbol{Y} = \boldsymbol{\nu}^{(A_1,R,A_2)}(\boldsymbol{\gamma}, \boldsymbol{\lambda}) + \boldsymbol{\epsilon}^{(A_1,R,A_2)}$, where $\boldsymbol{\epsilon}^{(A_1,R,A_2)} \sim \boldsymbol{\mathcal{N}}_T(\boldsymbol{0}, \boldsymbol{\Sigma}^{(A_1,R,A_2)})$; we define $\boldsymbol{\Sigma}^{(A_1,R,A_2)})$ below.

The estimands of primary interest are marginal over response to first-stage treatment; however, the simulation framework described above uses generative models which are conditional on response to first-stage treatment. Here, we describe how to derive conditional quantities which, when averaged over response, yield the desired marginal characteristics.

Table S3: Estimated unstructured marginal covariance matrices $\text{Var}(\boldsymbol{Y}^{(d)})$ by DTR d for $\delta = 0.3$ and $\rho = 0.3$ with $r_1 = r_{-1} = 0.4$ under R_+. All working assumptions are satisfied. The "Pooled over DTR" entry is the mean of all DTR-specific estimates; "Exchangeable Est." is the estimated matrix when the true correlation structure is assumed exchangeable and constant across DTRs, and estimated as such.

Design	**DTR (a_1, a_{2R}, a_{2NR})**			
design I	$(1,1,1)$	$(1,1,-1)$	$(1,-1,1)$	$(1,-1,-1)$
	$\begin{pmatrix} 64.1 & 19.3 & 17.5 \\ 19.3 & 64.0 & 13.1 \\ 17.5 & 13.1 & 59.3 \end{pmatrix}$	$\begin{pmatrix} 63.9 & 19.4 & 17.5 \\ 19.4 & 63.8 & 13.2 \\ 17.5 & 13.2 & 59.5 \end{pmatrix}$	$\begin{pmatrix} 64.2 & 19.4 & 20.3 \\ 19.4 & 63.9 & 22.4 \\ 20.3 & 22.4 & 63.4 \end{pmatrix}$	$\begin{pmatrix} 64.0 & 19.5 & 20.4 \\ 19.5 & 63.7 & 22.5 \\ 20.4 & 22.5 & 63.7 \end{pmatrix}$
	$(-1,1,1)$	$(-1,1,-1)$	$(-1,-1,1)$	$(-1,-1,-1)$
	$\begin{pmatrix} 63.5 & 19.2 & 18.5 \\ 19.2 & 64.0 & 16.5 \\ 18.5 & 16.5 & 63.6 \end{pmatrix}$	$\begin{pmatrix} 63.6 & 19.3 & 20.2 \\ 19.3 & 63.8 & 22.7 \\ 20.2 & 22.7 & 63.4 \end{pmatrix}$	$\begin{pmatrix} 63.7 & 19.2 & 18.6 \\ 19.2 & 63.9 & 16.6 \\ 18.6 & 16.6 & 63.7 \end{pmatrix}$	$\begin{pmatrix} 63.9 & 19.3 & 20.3 \\ 19.3 & 63.7 & 22.7 \\ 20.3 & 22.7 & 63.5 \end{pmatrix}$
	Pooled over DTR	Exchangeable Est.		
	$\begin{pmatrix} 63.9 & 19.3 & 19.1 \\ 19.3 & 63.8 & 18.7 \\ 19.1 & 18.7 & 62.5 \end{pmatrix}$	$\begin{pmatrix} 63.4 & 18.9 & 18.9 \\ 18.9 & 63.4 & 18.9 \\ 18.9 & 18.9 & 63.4 \end{pmatrix}$		
design II	$(1,0,1)$	$(1,0,-1)$	$(-1,0,1)$	$(-1,0,-1)$
	$\begin{pmatrix} 35.9 & 10.9 & 10.9 \\ 10.9 & 35.8 & 11.1 \\ 10.9 & 11.1 & 35.9 \end{pmatrix}$	$\begin{pmatrix} 35.9 & 10.9 & 10.5 \\ 10.9 & 35.9 & 9.3 \\ 10.5 & 9.3 & 35.8 \end{pmatrix}$	$\begin{pmatrix} 35.9 & 10.9 & 11.6 \\ 10.9 & 35.8 & 13.4 \\ 11.6 & 13.4 & 35.8 \end{pmatrix}$	$\begin{pmatrix} 36.0 & 10.9 & 10.9 \\ 10.9 & 35.9 & 10.6 \\ 10.9 & 10.6 & 35.9 \end{pmatrix}$
	Pooled over DTR	Exchangeable Est.		
	$\begin{pmatrix} 35.9 & 10.9 & 11.0 \\ 10.9 & 35.9 & 11.1 \\ 11.0 & 11.1 & 35.8 \end{pmatrix}$	$\begin{pmatrix} 35.9 & 10.9 & 10.9 \\ 10.9 & 35.9 & 10.9 \\ 10.9 & 10.9 & 35.9 \end{pmatrix}$		
design III	$(1,0,1)$	$(1,0,-1)$	$(-1,0,0)$	
	$\begin{pmatrix} 63.8 & 19.6 & 19.0 \\ 19.6 & 63.7 & 18.2 \\ 19.0 & 18.2 & 63.5 \end{pmatrix}$	$\begin{pmatrix} 63.84 & 19.33 & 20.81 \\ 19.33 & 63.70 & 24.32 \\ 20.81 & 24.32 & 63.47 \end{pmatrix}$	$\begin{pmatrix} 63.92 & 19.38 & 20.03 \\ 19.38 & 63.61 & 21.24 \\ 20.03 & 21.24 & 63.83 \end{pmatrix}$	
	Pooled over DTR	Exchangeable Est.		
	$\begin{pmatrix} 63.9 & 19.4 & 19.9 \\ 19.4 & 63.7 & 21.3 \\ 19.9 & 21.3 & 63.6 \end{pmatrix}$	$\begin{pmatrix} 63.8 & 20.0 & 20.0 \\ 20.0 & 63.8 & 20.0 \\ 20.0 & 20.0 & 63.8 \end{pmatrix}$		

We first describe the conditional mean models used to generate $\boldsymbol{Y}$ in step 4. For all designs, the conditional mean model used is

$$\nu_t^{(A_1,R,A_{2R})}(\boldsymbol{\gamma},\boldsymbol{\lambda}) = \mu_t^{\left(A_1,R\cdot A_{2R},(1-R)\cdot A_{2NR}\right)}(\boldsymbol{\gamma}) + \mathbb{1}_{\{t>t^*\}}(t-t^*)(R-r_{A_1})(\lambda_1+\lambda_2 A_1), \tag{S13}$$

where $\mu_t^{\left(A_1,R\cdot A_{2R},(1-R)\cdot A_{2NR}\right)}(\boldsymbol{\gamma})$ is the design-specific marginal mean model (see the supplement for examples). Notice the absence of $\boldsymbol{X}$; since our sample size formulae do not account for baseline covariates, we omit them for our simulations. Denote by $\boldsymbol{\nu}^{(A_1,R,A_{2R})}(\boldsymbol{\gamma},\boldsymbol{\lambda})$ the length-T vector which has j^{th} element $\nu_{t_j}^{(A_1,R,A_{2R})}(\boldsymbol{\gamma},\boldsymbol{\lambda})$.

In equation (S13), we can interepret λ_1 as the average difference in "second-stage intercept" between responders and non-responders to the same first-stage treatment. Similarly, we can view λ_2 as the average difference in "second-stage intercept" between responders and non-responders to opposite first-stage treatments. Together, $\boldsymbol{\gamma}$ and $\boldsymbol{\lambda}$ completely specify all conditional means for each design which, by construction, are guaranteed to average over response to $\mu_t^{(a_1,a_{2R},a_{2NR})}(\boldsymbol{\gamma})$ for all $t>t^*$.

It remains to compute conditional variance matrices $\boldsymbol{\Sigma}^{(A_1,R,A_2)}$. As with the mean models, these conditional covariance matrices must account for the design of the SMART, which may suggest constraints on the possible forms $\boldsymbol{\Sigma}^{(A_1,R,A_2)}$ can take (see section 3.1 or Lu et al. [2016]). In particular, the "conditional" variances of Y_0 and Y_1 are exactly the marginal variances, since response has not yet been observed. Under working assumption A2, we have

$$\boldsymbol{\Sigma}^{(A_1,R,A_2)} = \begin{bmatrix} \sigma^2 & \rho\sigma^2 & \sigma\rho_{02}^{(A_1,R,A_2)}\sigma_2^{(A_1,R,A_2)} \\ \rho\sigma^2 & \sigma^2 & \sigma\rho_{12}^{(A_1,R,A_2)}\sigma_2^{(A_1,R,A_2)} \\ \sigma\rho_{02}^{(A_1,R,A_2)}\sigma_2^{(A_1,R,A_2)} & \sigma\rho_{12}^{(A_1,R,A_2)}\sigma_2^{(A_1,R,A_2)} & \left(\sigma_2^{(A_1,R,A_2)}\right)^2 \end{bmatrix},$$

We assume, for simplicity in our generative model, that $\rho_{02}^{(A_1,R,A_2)} = \rho_{12}^{(A_1,R,A_2)} = \rho^{(A_1,R,A_2)}$ for all A_1, R, and A_2. Given these quantities for responders, i.e., $\sigma_2^{(A_1,1,A_2)}$ and $\rho^{(A_1,1,A_2)}$, we can find appropriate values for the non-responders such that the conditional variance matrices marginalize correctly. By the law of total variance, we have

$$\left(\sigma_2^{(A_1,0,A_2)}\right)^2 = \frac{1}{1-r_{A_1}}\cdot\left(\sigma^2 - r_{A_1}\left(\sigma_2^{(A_1,1,A_2)}\right)^2\right) - r_{A_1}\left(\nu_2^{A_1,1,A_2}(\boldsymbol{\gamma},\boldsymbol{\lambda}) - \nu_2^{A_1,0,A_2}(\boldsymbol{\gamma},\boldsymbol{\lambda})\right)^2.$$

Similarly, by the law of total covariance, we have

$$\rho^{(A_1,0,A_2)} = \frac{\rho\sigma - r_{A_1}\rho^{(A_1,1,A_2)}\sigma_2^{(A_1,1,A_2)}}{(1-r_{A_1})\sigma_2^{(A_1,0,A_2)}}.$$

This fully specifies the data generative model discussed above.

S7 Additional Simulation Results

In the following pages, we present additional simulation results for the curious reader. We explore multiple definitions of response $R_i^{(a_1)} = g_{a_1}\left(Y_{1,i}^{(a_1)}\right)$ and the performance of the sharp sample size formula (S8). We also present diagnostic measures such as coverage of z-based 95% confidence intervals.

For each of designs I to III, we consider the scenarios presented in table 4. See appendix C for details on how data for each scenario were generated.

Response Definitions

We consider the following definitions of response:

- $\boldsymbol{R}_{\perp\!\!\!\perp}$: $g_{a_1}(Y_{1,i}^{(a_1)}) = X_i^{(a_1)}$, where $X_i^{(a_1)} \sim \text{Bernoulli}(r_{a_1})$ is independent of all other observed data.
- $\boldsymbol{R}_{+}$: $g_{a_1}(Y_{1,i}^{(a_1)}) = X_i^{(a_1)}$, where $X_i^{(a_1)} \sim \text{Bernoulli}(r_{a_1,i}^{+})$, where $r_{a_1,i}^{+}$ is positively correlated with $Y_{1,i}^{(a_1)}$.
- $\boldsymbol{R}_{-}$: $g_{a_1}(Y_{1,i}^{(a_1)}) = X_i^{(a_1)}$, where $X_i^{(a_1)} \sim \text{Bernoulli}(r_{a_1,i}^{-})$, where $r_{a_1,i}^{-}$ is negatively correlated with $Y_{1,i}^{(a_1)}$
- $\boldsymbol{R}_{+}^{\boldsymbol{1\kappa}}$: $g_{a_1}(Y_{1,i}^{(a_1)}) = \mathbb{1}\left\{Y_{1,i}^{(a_1)} \geq \kappa\right\}$, where κ is the $(1-r_1)$th quantile of the $\mathcal{N}(\mu_1^{(a_1=1)}, \sigma^2)$ distribution.
- $\boldsymbol{R}_{-}^{\boldsymbol{1\kappa}}$: $g_{a_1}(Y_{1,i}^{(a_1)}) = \mathbb{1}\left\{Y_{1,i}^{(a_1)} \leq \kappa\right\}$, where κ is the r_1th quantile of the $\mathcal{N}(\mu_1^{(a_1=1)}, \sigma^2)$ distribution.
- $\boldsymbol{R}_{+}^{\boldsymbol{2\kappa}}$: $g_{a_1}(Y_{1,i}^{(a_1)}) = \mathbb{1}\left\{Y_{1,i}^{(a_1)} \geq \kappa_{a_1}\right\}$, where κ_{a_1} is the $(1-r_{a_1})$th quantile of the $\mathcal{N}(\mu_1^{(a_1)}, \sigma^2)$ distribution.
- $\boldsymbol{R}_{-}^{\boldsymbol{2\kappa}}$: $g_{a_1}(Y_{1,i}^{(a_1)}) = \mathbb{1}\left\{Y_{1,i}^{(a_1)} \leq \kappa_{a_1}\right\}$, where κ_{a_1} is the r_{a_1}th quantile of the $\mathcal{N}(\mu_1^{(a_1)}, \sigma^2)$ distribution.
- $\boldsymbol{R}_{+}^{\boldsymbol{2}}$: $g_{a_1}(Y_{1,i}^{(a_1)}) = \mathbb{1}\left\{Y_1^{(d)} \in \left(-\infty, \kappa_{a_1}^{\text{low}}\right] \cup \left[\kappa_{a_1}^{\text{high}}, \infty\right)\right\}$, where κ^{low} and κ^{high} are chosen to be the $r/2$ and $(1-r/2)$th quantiles of the $\mathcal{N}(\mu_1^{(d)}, \sigma^2)$ distribution, respectively.
- $\boldsymbol{R}_{-}^{\boldsymbol{2}}$: $g_{a_1}(Y_{1,i}^{(a_1)}) = \mathbb{1}\left\{Y_1^{(d)} \in \left(\kappa_{a_1}^{\text{low}}, \kappa_{a_1}^{\text{high}}\right)\right\}$, where κ^{low} and κ^{high} are chosen to be the $r/2$ and $(1-r/2)$th quantiles of the $\mathcal{N}(\mu_1^{(d)}, \sigma^2)$ distribution, respectively.

Description of Table Formatting

Descriptions of the columns are as follows:

- $\boldsymbol{\delta}$: The true standardized effect size in the generated data (see equation (9))
- **Response**: Shorthand notation for the function g defining response (see appendix C)
- **Formula**: The sample size formula used; either "cons" (formula (10)) or "sharp" (formula (S8))
- $\boldsymbol{r_{-1}}$: The (average) probability of response to the first-stage treatment labeled -1
- $\boldsymbol{r_1}$: The (average) probability of response to the first-stage treatment labeled 1
- $\boldsymbol{\rho}$: The true within-person correlation in the generated data
- $\boldsymbol{\rho}_{\text{size}}$: The estimated within-person correlation used in the sample size formula
- $\boldsymbol{n}$: The computed sample size using the appropriate sample size formula

- $\mathbf{1-\hat{\boldsymbol{\beta}}}$: Empirical power based on 3,000 simulations
- ***p* value**: p-value for the test of $H_0 : 1-\hat{\beta} = 0.80$ vs. $H_1 : 1-\hat{\beta} < 0.80$ (* indicates the test is significant at the 5% level)
- **Coverage**: The proportion of simulations for which a 95% z confidence interval constructed around $\hat{\boldsymbol{\gamma}}$ contains the true parameter vector $\boldsymbol{\gamma}$
- ***p* value**: p-value for the test of H_0 : Coverage = 0.95 vs. H_1 : Coverage $\neq$ 0.80 (* indicates the test is significant at the 5% level)
- $\mathbf{Cor(\boldsymbol{R}, Y_0^2)}$: An estimate of $\mathrm{Cor}(R^{(a_1^{(d)})}, (Y_0^{(d)} - \mu_0^{(d)})^2)$
- $\mathbf{Cor(\boldsymbol{R}, Y_1^2)}$: An estimate of $\mathrm{Cor}(R^{(a_1^{(d)})}, (Y_1^{(d)} - \mu_1^{(d)})^2)$
- $\mathbf{Cor(\boldsymbol{R}, Y_0 Y_1)}$: An estimate of $\mathrm{Cor}(R^{(a_1^{(d)})}, (Y_0^{(d)} - \mu_0^{(d)})(Y_1^{(d)} - \mu_1^{(d)}))$
- $\mathbf{Cov(Y_0, Y_2)}$: The signed percent difference between $c_0 = \mathrm{Cov}(Y_0^{(d)}, Y_2^{(d)} \mid R^{(a_1^{(d)})} = 0)$ and $c_1 = \mathrm{Cov}(Y_0^{(d)}, Y_2^{(d)} \mid R^{(a_1^{(d)})} = 1)$:

  $$\text{“}\mathrm{Cov}(Y_0, Y_2)\text{”} = \mathrm{sign}\,(c_1 - c_0) \cdot \frac{|c_1 - c_0|}{|c_0|}.$$

  If the value in the table is negative, working assumption A1(c) is satisfied. Note that when $\rho = \rho_{\text{size}} = 0$, these values are quite large; this is a result of the covariances being very small and does not reflect a large violation of the working assumption.
- $\mathbf{Cov(Y_1, Y_2)}$: Analogous to $\mathrm{Cov}(Y_0, Y_2)$, with $c_0 = \mathrm{Cov}(Y_1^{(d)}, Y_2^{(d)} \mid R^{(a_1^{(d)})} = 0)$ and $c_1 = \mathrm{Cov}(Y_1^{(d)}, Y_2^{(d)} \mid R^{(a_1^{(d)})} = 1)$
- **% Valid**: The proportion of 3,000 simulation runs in which the generated SMART contained at least one individual consistent with each embedded DTR.

S7.1 Additional Simulations for Design I

Table S4: Additional simulation results for design I when working assumptions A1 and A2 are satisfied

δ	Response	Formula	r_{-1}	r_1	ρ	ρ_{size}	n	$1-\hat{\beta}$	p value	Coverage	p value	Cor(R, Y_0^2)	Cor(R, Y_1^2)	Cor$(R, Y_0 Y_1)$	Cov(Y_0, Y_2)	Cov(Y_1, Y_2)	% Valid
0.3	R_+	cons.	0.4	0.4	0.0	0.0	698	0.807	0.848	0.955	0.258	0.001	0.077	-0.001	-2.906	23.178	100.0
0.3	R_+	cons.	0.4	0.4	0.3	0.3	635	0.817	0.990	0.949	0.867	0.008	0.078	0.032	-0.014	-0.099	100.0
0.3	R_+	cons.	0.4	0.4	0.6	0.6	447	0.862	1.000	0.951	0.834	0.028	0.078	0.057	-0.049	-0.096	100.0
0.3	R_+	cons.	0.4	0.4	0.8	0.8	252	0.925	1.000	0.946	0.276	0.051	0.078	0.069	-0.073	-0.102	100.0
0.3	R_+	cons.	0.4	0.6	0.0	0.0	698	0.784	0.016*	0.945	0.209	-0.001	0.012	-0.001	-27.792	-2.362	100.0
0.3	R_+	cons.	0.4	0.6	0.3	0.3	635	0.823	0.999	0.952	0.706	0.002	0.009	0.005	-0.001	-0.014	100.0
0.3	R_+	cons.	0.4	0.6	0.6	0.6	447	0.843	1.000	0.946	0.315	0.003	0.010	0.009	-0.004	-0.010	100.0
0.3	R_+	cons.	0.4	0.6	0.8	0.8	252	0.900	1.000	0.947	0.503	0.007	0.010	0.008	-0.005	-0.006	100.0
0.3	R_+	cons.	0.6	0.4	0.0	0.0	698	0.793	0.186	0.941	0.026*	0.001	0.011	-0.001	0.386	-4.877	100.0
0.3	R_+	cons.	0.6	0.4	0.3	0.3	635	0.824	1.000	0.954	0.379	0.001	0.009	0.004	0.004	0.006	100.0
0.3	R_+	cons.	0.6	0.4	0.6	0.6	447	0.875	1.000	0.935	0.000*	0.003	0.009	0.007	-0.004	-0.007	100.0
0.3	R_+	cons.	0.6	0.4	0.8	0.8	252	0.927	1.000	0.945	0.180	0.006	0.009	0.007	-0.007	-0.009	100.0
0.3	R_+	cons.	0.6	0.6	0.0	0.0	698	0.799	0.471	0.947	0.451	-0.001	-0.061	-0.001	-5.979	-2.460	100.0
0.3	R_+	cons.	0.6	0.6	0.3	0.3	635	0.813	0.969	0.951	0.900	-0.006	-0.061	-0.024	0.021	0.075	100.0
0.3	R_+	cons.	0.6	0.6	0.6	0.6	447	0.856	1.000	0.943	0.071	-0.022	-0.061	-0.044	0.041	0.087	100.0
0.3	R_+	cons.	0.6	0.6	0.8	0.8	252	0.901	1.000	0.940	0.013*	-0.040	-0.061	-0.054	0.063	0.084	100.0
0.3	R_+	sharp	0.4	0.4	0.3	0.3	618	0.814	0.975	0.944	0.111	0.007	0.078	0.032	-0.023	-0.098	100.0
0.3	R_+	sharp	0.4	0.4	0.6	0.6	416	0.840	1.000	0.942	0.059	0.030	0.078	0.058	-0.051	-0.096	100.0
0.3	R_+	sharp	0.4	0.4	0.8	0.8	227	0.899	1.000	0.942	0.040*	0.049	0.077	0.068	-0.079	-0.105	100.0
0.3	R_+	sharp	0.4	0.6	0.3	0.3	618	0.809	0.896	0.951	0.900	0.002	0.010	0.005	0.006	-0.005	100.0
0.3	R_+	sharp	0.4	0.6	0.6	0.6	416	0.830	1.000	0.946	0.276	0.003	0.008	0.007	-0.007	-0.011	100.0
0.3	R_+	sharp	0.4	0.6	0.8	0.8	227	0.875	1.000	0.943	0.071	0.007	0.011	0.009	-0.014	-0.015	100.0
0.3	R_+	sharp	0.6	0.4	0.3	0.3	618	0.813	0.969	0.946	0.276	0.003	0.011	0.006	-0.000	-0.009	100.0
0.3	R_+	sharp	0.6	0.4	0.6	0.6	416	0.848	1.000	0.949	0.867	0.006	0.009	0.007	0.003	-0.005	100.0
0.3	R_+	sharp	0.6	0.4	0.8	0.8	227	0.900	1.000	0.945	0.180	0.009	0.013	0.012	-0.011	-0.015	100.0
0.3	R_+	sharp	0.6	0.6	0.3	0.3	618	0.815	0.980	0.944	0.111	-0.005	-0.059	-0.023	0.017	0.084	100.0
0.3	R_+	sharp	0.6	0.6	0.6	0.6	416	0.845	1.000	0.949	0.801	-0.022	-0.061	-0.044	0.040	0.078	100.0
0.3	R_+	sharp	0.6	0.6	0.8	0.8	227	0.880	1.000	0.947	0.503	-0.039	-0.062	-0.055	0.053	0.075	100.0
0.3	R_-	cons.	0.4	0.4	0.0	0.0	698	0.803	0.650	0.953	0.476	0.001	0.079	0.001	2.023	-3.344	100.0
0.3	R_-	cons.	0.4	0.4	0.3	0.3	635	0.800	0.507	0.957	0.079	0.008	0.079	0.031	-0.020	-0.100	100.0
0.3	R_-	cons.	0.4	0.4	0.6	0.6	447	0.773	0.000*	0.950	0.933	0.027	0.079	0.057	-0.051	-0.102	100.0
0.3	R_-	cons.	0.4	0.4	0.8	0.8	252	0.733	0.000*	0.941	0.033*	0.051	0.079	0.069	-0.072	-0.101	100.0
0.3	R_-	cons.	0.4	0.6	0.0	0.0	698	0.792	0.132	0.949	0.867	-0.001	0.013	0.001	-0.712	4.656	100.0
0.3	R_-	cons.	0.4	0.6	0.3	0.3	635	0.789	0.064	0.954	0.379	0.002	0.011	0.003	-0.015	-0.008	100.0
0.3	R_-	cons.	0.4	0.6	0.6	0.6	447	0.805	0.760	0.949	0.737	0.004	0.010	0.007	0.000	-0.006	100.0
0.3	R_-	cons.	0.4	0.6	0.8	0.8	252	0.767	0.000*	0.949	0.737	0.007	0.010	0.009	-0.005	-0.005	100.0
0.3	R_-	cons.	0.6	0.4	0.0	0.0	698	0.803	0.683	0.950	0.967	0.001	0.014	0.001	1.690	-28.430	100.0
0.3	R_-	cons.	0.6	0.4	0.3	0.3	635	0.791	0.114	0.948	0.557	0.000	0.010	0.002	-0.002	-0.018	100.0
0.3	R_-	cons.	0.6	0.4	0.6	0.6	447	0.784	0.018*	0.944	0.111	0.004	0.010	0.007	-0.009	-0.014	100.0
0.3	R_-	cons.	0.6	0.4	0.8	0.8	252	0.740	0.000*	0.947	0.402	0.007	0.011	0.009	-0.001	-0.003	100.0
0.3	R_-	cons.	0.6	0.6	0.0	0.0	698	0.806	0.787	0.949	0.867	-0.001	-0.059	0.001	5.713	-1.166	100.0
0.3	R_-	cons.	0.6	0.6	0.3	0.3	635	0.792	0.152	0.947	0.402	-0.006	-0.060	-0.025	0.022	0.083	100.0
0.3	R_-	cons.	0.6	0.6	0.6	0.6	447	0.798	0.382	0.950	1.000	-0.021	-0.060	-0.044	0.043	0.084	100.0
0.3	R_-	cons.	0.6	0.6	0.8	0.8	252	0.758	0.000*	0.946	0.315	-0.039	-0.059	-0.052	0.064	0.088	100.0

Continued on next page

Additional simulation results for design I when working assumptions A1 and A2 are satisfied

δ	Response	Formula	r_{-1}	r_1	ρ	ρ_{size}	n	$1-\hat{\beta}$	p value	Coverage	p value	$\text{Cor}(R, Y_0^2)$	$\text{Cor}(R, Y_1^2)$	$\text{Cor}(R, Y_0Y_1)$	$\text{Cov}(Y_0, Y_2)$	$\text{Cov}(Y_1, Y_2)$	% Valid
0.3	R_-	sharp	0.4	0.4	0.3	0.3	618	0.774	0.000*	0.945	0.241	0.007	0.078	0.031	-0.026	-0.106	100.0
0.3	R_-	sharp	0.4	0.4	0.6	0.6	416	0.756	0.000*	0.938	0.004*	0.028	0.079	0.057	-0.051	-0.102	100.0
0.3	R_-	sharp	0.4	0.4	0.8	0.8	227	0.698	0.000*	0.945	0.209	0.050	0.080	0.070	-0.073	-0.099	100.0
0.3	R_-	sharp	0.4	0.6	0.3	0.3	618	0.781	0.006*	0.939	0.007*	0.001	0.010	0.004	-0.016	-0.012	100.0
0.3	R_-	sharp	0.4	0.6	0.6	0.6	416	0.776	0.001*	0.951	0.900	0.005	0.010	0.007	-0.001	-0.005	100.0
0.3	R_-	sharp	0.4	0.6	0.8	0.8	227	0.727	0.000*	0.944	0.132	0.009	0.015	0.014	-0.003	-0.005	100.0
0.3	R_-	sharp	0.6	0.4	0.3	0.3	618	0.768	0.000*	0.949	0.737	0.002	0.009	0.003	-0.003	-0.010	100.0
0.3	R_-	sharp	0.6	0.4	0.6	0.6	416	0.738	0.000*	0.952	0.706	0.004	0.010	0.008	-0.004	-0.009	100.0
0.3	R_-	sharp	0.6	0.4	0.8	0.8	227	0.701	0.000*	0.946	0.276	0.009	0.014	0.013	-0.005	-0.007	100.0
0.3	R_-	sharp	0.6	0.6	0.3	0.3	618	0.782	0.007*	0.947	0.402	-0.006	-0.061	-0.026	0.014	0.079	100.0
0.3	R_-	sharp	0.6	0.6	0.6	0.6	416	0.773	0.000*	0.949	0.867	-0.023	-0.059	-0.045	0.041	0.083	100.0
0.3	R_-	sharp	0.6	0.6	0.8	0.8	227	0.737	0.000*	0.943	0.086	-0.038	-0.059	-0.052	0.063	0.085	100.0
0.3	$R_{\perp\!\!\!\perp}$	cons.	0.4	0.4	0.0	0.0	698	0.798	0.399	0.945	0.241	-0.000	-0.001	0.001	0.329	-0.532	100.0
0.3	$R_{\perp\!\!\!\perp}$	cons.	0.4	0.4	0.0	0.0	698	0.791	0.123	0.950	1.000	0.001	-0.001	-0.000	-2.441	0.236	100.0
0.3	$R_{\perp\!\!\!\perp}$	cons.	0.4	0.4	0.3	0.3	635	0.819	0.995	0.949	0.737	0.002	0.000	-0.000	-0.001	0.006	100.0
0.3	$R_{\perp\!\!\!\perp}$	cons.	0.4	0.4	0.3	0.3	635	0.818	0.993	0.952	0.706	0.001	-0.000	0.001	0.003	0.009	100.0
0.3	$R_{\perp\!\!\!\perp}$	cons.	0.4	0.4	0.6	0.6	447	0.815	0.980	0.944	0.111	0.001	-0.001	0.000	-0.002	-0.005	100.0
0.3	$R_{\perp\!\!\!\perp}$	cons.	0.4	0.4	0.6	0.6	447	0.836	1.000	0.951	0.834	-0.001	-0.002	-0.001	0.005	0.011	100.0
0.3	$R_{\perp\!\!\!\perp}$	cons.	0.4	0.4	0.8	0.8	252	0.835	1.000	0.955	0.194	0.002	0.002	0.002	0.003	0.003	100.0
0.3	$R_{\perp\!\!\!\perp}$	cons.	0.4	0.4	0.8	0.8	252	0.847	1.000	0.943	0.086	-0.003	-0.002	-0.003	0.005	0.007	100.0
0.3	$R_{\perp\!\!\!\perp}$	cons.	0.4	0.6	0.0	0.0	698	0.804	0.699	0.952	0.706	-0.001	-0.000	0.002	1.966	-1.472	100.0
0.3	$R_{\perp\!\!\!\perp}$	cons.	0.4	0.6	0.0	0.0	698	0.807	0.825	0.947	0.402	0.001	-0.001	-0.002	-1.509	0.509	100.0
0.3	$R_{\perp\!\!\!\perp}$	cons.	0.4	0.6	0.3	0.3	635	0.802	0.632	0.948	0.615	0.000	0.001	-0.001	-0.001	0.012	100.0
0.3	$R_{\perp\!\!\!\perp}$	cons.	0.4	0.6	0.3	0.3	635	0.815	0.982	0.946	0.315	-0.001	-0.001	-0.003	0.007	0.014	100.0
0.3	$R_{\perp\!\!\!\perp}$	cons.	0.4	0.6	0.6	0.6	447	0.819	0.996	0.950	0.967	0.002	-0.002	0.002	0.001	0.001	100.0
0.3	$R_{\perp\!\!\!\perp}$	cons.	0.4	0.6	0.6	0.6	447	0.837	1.000	0.947	0.503	-0.001	-0.001	-0.002	0.020	0.018	100.0
0.3	$R_{\perp\!\!\!\perp}$	cons.	0.4	0.6	0.8	0.8	252	0.836	1.000	0.949	0.801	0.003	0.001	0.002	0.007	0.005	100.0
0.3	$R_{\perp\!\!\!\perp}$	cons.	0.4	0.6	0.8	0.8	252	0.844	1.000	0.948	0.675	0.003	0.002	0.003	-0.090	-0.091	100.0
0.3	$R_{\perp\!\!\!\perp}$	cons.	0.6	0.4	0.0	0.0	698	0.795	0.253	0.953	0.426	0.001	0.000	-0.002	2.232	-0.917	100.0
0.3	$R_{\perp\!\!\!\perp}$	cons.	0.6	0.4	0.0	0.0	698	0.797	0.331	0.948	0.615	0.002	-0.001	-0.000	1.407	0.552	100.0
0.3	$R_{\perp\!\!\!\perp}$	cons.	0.6	0.4	0.3	0.3	635	0.806	0.787	0.952	0.645	-0.000	-0.001	0.001	0.001	0.007	100.0
0.3	$R_{\perp\!\!\!\perp}$	cons.	0.6	0.4	0.3	0.3	635	0.818	0.993	0.957	0.079	0.001	-0.002	-0.001	0.018	0.011	100.0
0.3	$R_{\perp\!\!\!\perp}$	cons.	0.6	0.4	0.6	0.6	447	0.823	0.999	0.949	0.801	-0.002	0.002	-0.002	-0.003	0.001	100.0
0.3	$R_{\perp\!\!\!\perp}$	cons.	0.6	0.4	0.6	0.6	447	0.833	1.000	0.949	0.801	0.001	-0.001	-0.001	0.012	0.011	100.0
0.3	$R_{\perp\!\!\!\perp}$	cons.	0.6	0.4	0.8	0.8	252	0.837	1.000	0.939	0.007*	-0.003	-0.001	-0.002	-0.005	-0.002	100.0
0.3	$R_{\perp\!\!\!\perp}$	cons.	0.6	0.4	0.8	0.8	252	0.850	1.000	0.949	0.867	0.002	0.002	0.001	-0.095	-0.095	100.0
0.3	$R_{\perp\!\!\!\perp}$	cons.	0.6	0.6	0.0	0.0	698	0.796	0.283	0.942	0.059	0.000	0.001	-0.001	1.919	-1.397	100.0
0.3	$R_{\perp\!\!\!\perp}$	cons.	0.6	0.6	0.0	0.0	698	0.811	0.932	0.952	0.706	-0.001	0.001	-0.002	-3.154	2.568	100.0
0.3	$R_{\perp\!\!\!\perp}$	cons.	0.6	0.6	0.3	0.3	635	0.808	0.869	0.952	0.706	-0.002	-0.000	0.000	-0.008	-0.000	100.0
0.3	$R_{\perp\!\!\!\perp}$	cons.	0.6	0.6	0.3	0.3	635	0.809	0.896	0.951	0.834	-0.001	0.001	0.001	0.012	0.017	100.0
0.3	$R_{\perp\!\!\!\perp}$	cons.	0.6	0.6	0.6	0.6	447	0.833	1.000	0.943	0.094	-0.001	0.001	-0.000	0.001	0.007	100.0
0.3	$R_{\perp\!\!\!\perp}$	cons.	0.6	0.6	0.6	0.6	447	0.827	1.000	0.953	0.476	-0.001	0.001	-0.001	0.018	0.018	100.0
0.3	$R_{\perp\!\!\!\perp}$	cons.	0.6	0.6	0.8	0.8	252	0.827	1.000	0.939	0.006*	-0.002	-0.002	-0.002	-0.002	-0.001	100.0
0.3	$R_{\perp\!\!\!\perp}$	cons.	0.6	0.6	0.8	0.8	252	0.850	1.000	0.952	0.586	-0.004	-0.000	-0.002	-0.191	-0.189	100.0
0.3	$R_{\perp\!\!\!\perp}$	sharp	0.4	0.4	0.3	0.3	618	0.799	0.453	0.949	0.867	0.002	-0.002	0.002	0.002	0.009	100.0
0.3	$R_{\perp\!\!\!\perp}$	sharp	0.4	0.4	0.3	0.3	618	0.800	0.489	0.949	0.801	-0.001	0.001	0.001	-0.004	0.004	100.0
0.3	$R_{\perp\!\!\!\perp}$	sharp	0.4	0.4	0.6	0.6	416	0.791	0.114	0.945	0.180	-0.002	0.001	-0.001	0.008	0.012	100.0

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Additional simulation results for design I when working assumptions A1 and A2 are satisfied

δ	Response	Formula	r_{-1}	r_1	ρ	ρ_{size}	n	$1-\hat{\beta}$	p value	Coverage	p value	Cor(R, Y_0^2)	Cor(R, Y_1^2)	Cor(R, Y_0Y_1)	Cov(Y_0, Y_2)	Cov(Y_1, Y_2)	% Valid
0.3	$R_{\perp\!\!\!\perp}$	sharp	0.4	0.4	0.6	0.6	416	0.805	0.745	0.954	0.295	0.002	-0.002	0.002	0.004	0.001	100.0
0.3	$R_{\perp\!\!\!\perp}$	sharp	0.4	0.4	0.8	0.8	227	0.796	0.283	0.941	0.021*	0.003	0.003	0.003	0.013	0.011	100.0
0.3	$R_{\perp\!\!\!\perp}$	sharp	0.4	0.4	0.8	0.8	227	0.790	0.097	0.944	0.132	-0.001	0.003	-0.001	0.000	0.002	100.0
0.3	$R_{\perp\!\!\!\perp}$	sharp	0.4	0.6	0.3	0.3	618	0.809	0.904	0.952	0.645	0.001	-0.000	0.002	0.015	0.031	100.0
0.3	$R_{\perp\!\!\!\perp}$	sharp	0.4	0.6	0.3	0.3	618	0.787	0.040*	0.948	0.675	-0.001	-0.002	-0.002	-0.014	-0.007	100.0
0.3	$R_{\perp\!\!\!\perp}$	sharp	0.4	0.6	0.6	0.6	416	0.806	0.800	0.943	0.086	-0.002	-0.002	-0.002	0.014	0.016	100.0
0.3	$R_{\perp\!\!\!\perp}$	sharp	0.4	0.6	0.6	0.6	416	0.799	0.435	0.949	0.801	-0.003	-0.002	-0.002	-0.011	-0.006	100.0
0.3	$R_{\perp\!\!\!\perp}$	sharp	0.4	0.6	0.8	0.8	227	0.807	0.825	0.944	0.132	0.002	-0.001	0.001	-0.093	-0.097	100.0
0.3	$R_{\perp\!\!\!\perp}$	sharp	0.4	0.6	0.8	0.8	227	0.793	0.163	0.940	0.012*	-0.001	-0.002	-0.001	-0.000	-0.000	100.0
0.3	$R_{\perp\!\!\!\perp}$	sharp	0.6	0.4	0.3	0.3	618	0.807	0.837	0.949	0.801	-0.001	-0.002	-0.003	0.012	0.000	100.0
0.3	$R_{\perp\!\!\!\perp}$	sharp	0.6	0.4	0.3	0.3	618	0.796	0.315	0.942	0.059	0.001	0.002	0.002	0.004	0.005	100.0
0.3	$R_{\perp\!\!\!\perp}$	sharp	0.6	0.4	0.6	0.6	416	0.817	0.991	0.946	0.276	-0.001	-0.001	-0.001	0.010	0.012	100.0
0.3	$R_{\perp\!\!\!\perp}$	sharp	0.6	0.4	0.6	0.6	416	0.797	0.348	0.948	0.675	0.003	0.002	0.002	0.007	0.001	100.0
0.3	$R_{\perp\!\!\!\perp}$	sharp	0.6	0.4	0.8	0.8	227	0.810	0.919	0.944	0.132	-0.002	-0.001	-0.001	-0.102	-0.100	100.0
0.3	$R_{\perp\!\!\!\perp}$	sharp	0.6	0.4	0.8	0.8	227	0.786	0.033*	0.937	0.001*	0.001	0.002	0.001	0.002	0.001	100.0
0.3	$R_{\perp\!\!\!\perp}$	sharp	0.6	0.6	0.3	0.3	618	0.800	0.507	0.953	0.530	0.002	0.001	0.002	0.026	0.022	100.0
0.3	$R_{\perp\!\!\!\perp}$	sharp	0.6	0.6	0.3	0.3	618	0.797	0.331	0.948	0.675	0.001	-0.001	-0.001	-0.001	-0.003	100.0
0.3	$R_{\perp\!\!\!\perp}$	sharp	0.6	0.6	0.6	0.6	416	0.811	0.943	0.947	0.402	-0.001	-0.001	-0.001	0.013	0.011	100.0
0.3	$R_{\perp\!\!\!\perp}$	sharp	0.6	0.6	0.6	0.6	416	0.810	0.919	0.946	0.276	-0.002	0.002	-0.002	-0.001	-0.002	100.0
0.3	$R_{\perp\!\!\!\perp}$	sharp	0.6	0.6	0.8	0.8	227	0.811	0.938	0.946	0.357	0.002	0.002	0.002	-0.187	-0.187	100.0
0.3	$R_{\perp\!\!\!\perp}$	sharp	0.6	0.6	0.8	0.8	227	0.793	0.175	0.945	0.180	0.001	-0.003	0.001	-0.000	-0.002	100.0
0.5	R_+	cons.	0.4	0.4	0.0	0.0	252	0.801	0.562	0.942	0.059	-0.001	0.079	-0.003	15.305	0.679	100.0
0.5	R_+	cons.	0.4	0.4	0.3	0.3	229	0.815	0.982	0.940	0.012*	0.007	0.079	0.032	-0.019	-0.101	100.0
0.5	R_+	cons.	0.4	0.4	0.6	0.6	161	0.872	1.000	0.938	0.004*	0.031	0.081	0.061	-0.051	-0.100	100.0
0.5	R_+	cons.	0.4	0.4	0.8	0.8	91	0.931	1.000	0.936	0.001*	0.054	0.081	0.072	-0.087	-0.108	100.0
0.5	R_+	cons.	0.4	0.6	0.0	0.0	252	0.799	0.471	0.941	0.021*	-0.002	0.011	-0.002	12.072	1.704	100.0
0.5	R_+	cons.	0.4	0.6	0.3	0.3	229	0.823	0.999	0.946	0.315	-0.002	0.011	0.003	-0.013	-0.022	100.0
0.5	R_+	cons.	0.4	0.6	0.6	0.6	161	0.852	1.000	0.946	0.357	0.008	0.012	0.012	-0.006	-0.005	100.0
0.5	R_+	cons.	0.4	0.6	0.8	0.8	91	0.899	1.000	0.936	0.000*	0.010	0.011	0.012	-0.014	-0.013	100.0
0.5	R_+	cons.	0.6	0.4	0.0	0.0	252	0.795	0.268	0.947	0.402	-0.003	0.010	-0.002	2.184	1.344	100.0
0.5	R_+	cons.	0.6	0.4	0.3	0.3	229	0.828	1.000	0.945	0.180	0.002	0.009	0.003	0.014	-0.011	100.0
0.5	R_+	cons.	0.6	0.4	0.6	0.6	161	0.879	1.000	0.941	0.033*	0.005	0.010	0.009	0.002	0.003	100.0
0.5	R_+	cons.	0.6	0.4	0.8	0.8	91	0.923	1.000	0.936	0.001*	0.009	0.015	0.014	-0.020	-0.017	100.0
0.5	R_+	cons.	0.6	0.6	0.0	0.0	252	0.797	0.348	0.937	0.002*	-0.004	-0.060	-0.002	-0.466	-1.418	100.0
0.5	R_+	cons.	0.6	0.6	0.3	0.3	229	0.815	0.984	0.952	0.645	-0.009	-0.061	-0.026	0.002	0.051	100.0
0.5	R_+	cons.	0.6	0.6	0.6	0.6	161	0.859	1.000	0.946	0.315	-0.021	-0.060	-0.041	0.045	0.087	100.0
0.5	R_+	cons.	0.6	0.6	0.8	0.8	91	0.896	1.000	0.940	0.013*	-0.038	-0.060	-0.052	0.056	0.078	100.0
0.5	R_+	sharp	0.4	0.4	0.3	0.3	223	0.816	0.989	0.956	0.167	0.007	0.077	0.032	-0.030	-0.106	100.0
0.5	R_+	sharp	0.4	0.4	0.6	0.6	150	0.842	1.000	0.944	0.154	0.030	0.082	0.060	-0.054	-0.102	100.0
0.5	R_+	sharp	0.4	0.4	0.8	0.8	82	0.901	1.000	0.943	0.065	0.052	0.082	0.073	-0.091	-0.114	99.9
0.5	R_+	sharp	0.4	0.6	0.3	0.3	223	0.810	0.912	0.941	0.033*	0.002	0.009	0.004	0.012	-0.011	100.0
0.5	R_+	sharp	0.4	0.6	0.6	0.6	150	0.834	1.000	0.948	0.557	0.006	0.015	0.012	-0.004	-0.006	100.0
0.5	R_+	sharp	0.4	0.6	0.8	0.8	82	0.870	1.000	0.937	0.001*	0.008	0.013	0.010	-0.017	-0.010	99.9
0.5	R_+	sharp	0.6	0.4	0.3	0.3	223	0.815	0.984	0.941	0.033*	0.004	0.008	0.004	-0.001	-0.025	100.0
0.5	R_+	sharp	0.6	0.4	0.6	0.6	150	0.839	1.000	0.935	0.000*	0.003	0.009	0.007	-0.004	-0.009	100.0
0.5	R_+	sharp	0.6	0.4	0.8	0.8	82	0.892	1.000	0.936	0.000*	0.007	0.013	0.010	-0.015	-0.014	100.0
0.5	R_+	sharp	0.6	0.6	0.3	0.3	223	0.804	0.699	0.945	0.241	-0.004	-0.061	-0.024	0.032	0.084	100.0

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Additional simulation results for design I when working assumptions A1 and A2 are satisfied

δ	Response	Formula	r_{-1}	r_1	ρ	ρ_{size}	n	$1-\hat{\beta}$	p value	Coverage	p value	Cor(R, Y_0^2)	Cor(R, Y_1^2)	Cor(R, Y_0Y_1)	Cov(Y_0, Y_2)	Cov(Y_1, Y_2)	% Valid
0.5	R_+	sharp	0.6	0.6	0.6	0.6	150	0.833	1.000	0.944	0.154	-0.023	-0.064	-0.045	0.040	0.079	100.0
0.5	R_+	sharp	0.6	0.6	0.8	0.8	82	0.870	1.000	0.938	0.004*	-0.037	-0.062	-0.053	0.064	0.087	100.0
0.5	R_-	cons.	0.4	0.4	0.0	0.0	252	0.798	0.417	0.955	0.224	0.004	0.079	0.001	5.406	-0.139	100.0
0.5	R_-	cons.	0.4	0.4	0.3	0.3	229	0.797	0.331	0.944	0.154	0.009	0.079	0.033	-0.021	-0.099	100.0
0.5	R_-	cons.	0.4	0.4	0.6	0.6	161	0.789	0.070	0.937	0.002*	0.026	0.078	0.054	-0.058	-0.114	100.0
0.5	R_-	cons.	0.4	0.4	0.8	0.8	91	0.734	0.000*	0.934	0.000*	0.051	0.080	0.070	-0.065	-0.098	100.0
0.5	R_-	cons.	0.4	0.6	0.0	0.0	252	0.799	0.453	0.946	0.315	0.004	0.009	0.001	2.658	2.910	100.0
0.5	R_-	cons.	0.4	0.6	0.3	0.3	229	0.797	0.365	0.939	0.006*	0.001	0.010	0.006	-0.010	-0.001	100.0
0.5	R_-	cons.	0.4	0.6	0.6	0.6	161	0.797	0.331	0.944	0.111	0.002	0.011	0.007	-0.014	-0.017	100.0
0.5	R_-	cons.	0.4	0.6	0.8	0.8	91	0.769	0.000*	0.939	0.007*	0.005	0.011	0.007	0.002	-0.002	99.9
0.5	R_-	cons.	0.6	0.4	0.0	0.0	252	0.800	0.507	0.939	0.006*	0.002	0.010	0.001	-0.376	1.378	100.0
0.5	R_-	cons.	0.6	0.4	0.3	0.3	229	0.795	0.253	0.933	0.000*	0.001	0.011	0.006	-0.006	-0.014	100.0
0.5	R_-	cons.	0.6	0.4	0.6	0.6	161	0.792	0.142	0.947	0.451	0.003	0.012	0.007	-0.012	-0.014	100.0
0.5	R_-	cons.	0.6	0.4	0.8	0.8	91	0.760	0.000*	0.939	0.009*	0.011	0.012	0.012	0.010	0.000	100.0
0.5	R_-	cons.	0.6	0.6	0.0	0.0	252	0.810	0.919	0.947	0.402	0.001	-0.062	0.002	1.618	-1.119	100.0
0.5	R_-	cons.	0.6	0.6	0.3	0.3	229	0.808	0.878	0.944	0.154	-0.006	-0.060	-0.025	0.019	0.078	100.0
0.5	R_-	cons.	0.6	0.6	0.6	0.6	161	0.790	0.083	0.943	0.071	-0.025	-0.063	-0.049	0.040	0.076	100.0
0.5	R_-	cons.	0.6	0.6	0.8	0.8	91	0.765	0.000*	0.937	0.001*	-0.042	-0.060	-0.055	0.085	0.100	99.9
0.5	R_-	sharp	0.4	0.4	0.3	0.3	223	0.775	0.000*	0.944	0.154	0.007	0.080	0.032	-0.027	-0.102	100.0
0.5	R_-	sharp	0.4	0.4	0.6	0.6	150	0.762	0.000*	0.939	0.009*	0.028	0.081	0.058	-0.053	-0.108	100.0
0.5	R_-	sharp	0.4	0.4	0.8	0.8	82	0.702	0.000*	0.932	0.000*	0.051	0.081	0.070	-0.074	-0.108	99.9
0.5	R_-	sharp	0.4	0.6	0.3	0.3	223	0.793	0.186	0.948	0.615	0.002	0.011	0.005	0.007	-0.013	100.0
0.5	R_-	sharp	0.4	0.6	0.6	0.6	150	0.774	0.000*	0.939	0.007*	0.003	0.012	0.008	-0.003	-0.009	100.0
0.5	R_-	sharp	0.4	0.6	0.8	0.8	82	0.732	0.000*	0.942	0.040*	0.006	0.010	0.009	0.006	-0.005	99.9
0.5	R_-	sharp	0.6	0.4	0.3	0.3	223	0.783	0.013*	0.944	0.154	0.001	0.013	0.004	-0.012	-0.029	100.0
0.5	R_-	sharp	0.6	0.4	0.6	0.6	150	0.761	0.000*	0.942	0.049*	0.004	0.014	0.008	-0.017	-0.016	100.0
0.5	R_-	sharp	0.6	0.4	0.8	0.8	82	0.719	0.000*	0.930	0.000*	0.009	0.009	0.010	0.006	-0.006	100.0
0.5	R_-	sharp	0.6	0.6	0.3	0.3	223	0.802	0.632	0.948	0.675	-0.005	-0.058	-0.024	0.018	0.084	100.0
0.5	R_-	sharp	0.6	0.6	0.6	0.6	150	0.769	0.000*	0.938	0.004*	-0.024	-0.063	-0.046	0.039	0.085	100.0
0.5	R_-	sharp	0.6	0.6	0.8	0.8	82	0.721	0.000*	0.930	0.000*	-0.041	-0.063	-0.056	0.073	0.089	99.9
0.5	$R_{\perp\!\!\!\perp}$	cons.	0.4	0.4	0.0	0.0	252	0.799	0.453	0.953	0.476	0.002	0.001	-0.003	-7.229	2.731	100.0
0.5	$R_{\perp\!\!\!\perp}$	cons.	0.4	0.4	0.0	0.0	252	0.803	0.683	0.941	0.026*	-0.001	0.001	0.001	2.719	1.544	100.0
0.5	$R_{\perp\!\!\!\perp}$	cons.	0.4	0.4	0.3	0.3	229	0.813	0.961	0.948	0.557	-0.002	0.003	-0.003	-0.007	0.006	100.0
0.5	$R_{\perp\!\!\!\perp}$	cons.	0.4	0.4	0.3	0.3	229	0.824	1.000	0.952	0.645	0.001	-0.001	0.002	0.014	0.012	100.0
0.5	$R_{\perp\!\!\!\perp}$	cons.	0.4	0.4	0.6	0.6	161	0.824	1.000	0.947	0.503	-0.001	0.004	-0.000	-0.002	0.001	100.0
0.5	$R_{\perp\!\!\!\perp}$	cons.	0.4	0.4	0.6	0.6	161	0.839	1.000	0.939	0.009*	-0.002	-0.003	-0.003	0.000	-0.003	100.0
0.5	$R_{\perp\!\!\!\perp}$	cons.	0.4	0.4	0.8	0.8	91	0.843	1.000	0.946	0.315	-0.003	0.003	-0.001	0.004	0.004	100.0
0.5	$R_{\perp\!\!\!\perp}$	cons.	0.4	0.4	0.8	0.8	91	0.848	1.000	0.932	0.000*	0.003	0.002	0.002	0.013	0.007	100.0
0.5	$R_{\perp\!\!\!\perp}$	cons.	0.4	0.6	0.0	0.0	252	0.804	0.730	0.944	0.154	0.003	0.002	-0.002	3.037	0.143	100.0
0.5	$R_{\perp\!\!\!\perp}$	cons.	0.4	0.6	0.0	0.0	252	0.812	0.957	0.947	0.451	0.004	-0.002	0.002	-2.027	-7.197	100.0
0.5	$R_{\perp\!\!\!\perp}$	cons.	0.4	0.6	0.3	0.3	229	0.805	0.745	0.945	0.180	0.002	-0.002	0.003	0.008	0.004	100.0
0.5	$R_{\perp\!\!\!\perp}$	cons.	0.4	0.6	0.3	0.3	229	0.818	0.994	0.945	0.209	-0.002	0.001	0.002	-0.005	-0.001	100.0
0.5	$R_{\perp\!\!\!\perp}$	cons.	0.4	0.6	0.6	0.6	161	0.823	0.999	0.942	0.059	0.004	0.003	0.005	-0.004	-0.007	100.0
0.5	$R_{\perp\!\!\!\perp}$	cons.	0.4	0.6	0.6	0.6	161	0.844	1.000	0.943	0.086	0.001	0.002	-0.001	0.018	0.024	100.0
0.5	$R_{\perp\!\!\!\perp}$	cons.	0.4	0.6	0.8	0.8	91	0.833	1.000	0.939	0.009*	-0.006	-0.006	-0.006	-0.001	-0.001	100.0
0.5	$R_{\perp\!\!\!\perp}$	cons.	0.4	0.6	0.8	0.8	91	0.847	1.000	0.929	0.000*	-0.000	0.001	-0.002	-0.105	-0.102	99.9
0.5	$R_{\perp\!\!\!\perp}$	cons.	0.6	0.4	0.0	0.0	252	0.795	0.239	0.937	0.001*	-0.003	-0.002	0.002	-7.906	1.927	100.0

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Additional simulation results for design I when working assumptions A1 and A2 are satisfied

δ	Response	Formula	r_{-1}	r_1	ρ	ρ_{size}	n	$1-\hat{\beta}$	p value	Coverage	p value	Cor(R, Y_0^2)	Cor(R, Y_1^2)	Cor$(R, Y_0 Y_1)$	Cov(Y_0, Y_2)	Cov(Y_1, Y_2)	% Valid
0.5	$R_{\perp\!\!\perp}$	cons.	0.6	0.4	0.0	0.0	252	0.799	0.453	0.943	0.086	0.002	0.003	0.002	0.033	0.948	100.0
0.5	$R_{\perp\!\!\perp}$	cons.	0.6	0.4	0.3	0.3	229	0.805	0.745	0.942	0.040*	-0.002	0.002	-0.003	-0.010	0.013	100.0
0.5	$R_{\perp\!\!\perp}$	cons.	0.6	0.4	0.3	0.3	229	0.817	0.990	0.939	0.006*	0.003	0.002	0.002	0.022	0.025	100.0
0.5	$R_{\perp\!\!\perp}$	cons.	0.6	0.4	0.6	0.6	161	0.827	1.000	0.942	0.049*	-0.004	-0.003	-0.005	-0.009	-0.009	100.0
0.5	$R_{\perp\!\!\perp}$	cons.	0.6	0.4	0.6	0.6	161	0.836	1.000	0.943	0.086	0.001	-0.002	-0.001	0.010	0.014	100.0
0.5	$R_{\perp\!\!\perp}$	cons.	0.6	0.4	0.8	0.8	91	0.837	1.000	0.941	0.033*	0.006	0.006	0.006	0.004	0.004	100.0
0.5	$R_{\perp\!\!\perp}$	cons.	0.6	0.4	0.8	0.8	91	0.848	1.000	0.933	0.000*	-0.004	0.002	-0.003	-0.099	-0.095	100.0
0.5	$R_{\perp\!\!\perp}$	cons.	0.6	0.6	0.0	0.0	252	0.796	0.283	0.941	0.026*	-0.002	-0.001	0.003	110.092	-0.705	100.0
0.5	$R_{\perp\!\!\perp}$	cons.	0.6	0.6	0.0	0.0	252	0.803	0.683	0.944	0.132	-0.000	0.002	0.003	-1.441	-0.691	100.0
0.5	$R_{\perp\!\!\perp}$	cons.	0.6	0.6	0.3	0.3	229	0.817	0.991	0.944	0.154	0.002	-0.003	0.003	0.028	0.017	100.0
0.5	$R_{\perp\!\!\perp}$	cons.	0.6	0.6	0.3	0.3	229	0.819	0.997	0.950	0.967	-0.001	-0.003	-0.002	-0.003	0.006	100.0
0.5	$R_{\perp\!\!\perp}$	cons.	0.6	0.6	0.6	0.6	161	0.838	1.000	0.948	0.557	0.001	-0.004	0.000	-0.004	-0.006	100.0
0.5	$R_{\perp\!\!\perp}$	cons.	0.6	0.6	0.6	0.6	161	0.833	1.000	0.949	0.737	0.004	0.001	0.001	0.031	0.025	100.0
0.5	$R_{\perp\!\!\perp}$	cons.	0.6	0.6	0.8	0.8	91	0.835	1.000	0.935	0.000*	0.003	-0.003	0.001	-0.003	-0.008	100.0
0.5	$R_{\perp\!\!\perp}$	cons.	0.6	0.6	0.8	0.8	91	0.844	1.000	0.940	0.012*	0.005	0.003	0.003	-0.176	-0.177	100.0
0.5	$R_{\perp\!\!\perp}$	sharp	0.4	0.4	0.3	0.3	223	0.808	0.858	0.943	0.094	0.002	0.002	0.002	0.016	0.020	100.0
0.5	$R_{\perp\!\!\perp}$	sharp	0.4	0.4	0.3	0.3	223	0.798	0.382	0.942	0.049*	-0.004	-0.001	-0.002	-0.020	-0.014	100.0
0.5	$R_{\perp\!\!\perp}$	sharp	0.4	0.4	0.6	0.6	150	0.815	0.984	0.951	0.769	0.002	-0.001	0.002	0.006	0.006	100.0
0.5	$R_{\perp\!\!\perp}$	sharp	0.4	0.4	0.6	0.6	150	0.789	0.064	0.936	0.001*	0.001	0.002	0.001	0.002	0.000	100.0
0.5	$R_{\perp\!\!\perp}$	sharp	0.4	0.4	0.8	0.8	82	0.802	0.639	0.935	0.000*	0.001	0.002	0.001	0.013	0.014	99.9
0.5	$R_{\perp\!\!\perp}$	sharp	0.4	0.4	0.8	0.8	82	0.808	0.867	0.940	0.011*	0.002	0.002	0.002	-0.004	-0.002	100.0
0.5	$R_{\perp\!\!\perp}$	sharp	0.4	0.6	0.3	0.3	223	0.821	0.998	0.956	0.167	-0.003	-0.002	-0.004	0.014	0.019	100.0
0.5	$R_{\perp\!\!\perp}$	sharp	0.4	0.6	0.3	0.3	223	0.815	0.980	0.946	0.315	-0.001	-0.003	0.002	-0.007	-0.014	100.0
0.5	$R_{\perp\!\!\perp}$	sharp	0.4	0.6	0.6	0.6	150	0.811	0.943	0.939	0.009*	0.002	0.001	0.002	0.033	0.025	100.0
0.5	$R_{\perp\!\!\perp}$	sharp	0.4	0.6	0.6	0.6	150	0.808	0.869	0.949	0.867	-0.003	0.002	-0.001	-0.010	-0.002	100.0
0.5	$R_{\perp\!\!\perp}$	sharp	0.4	0.6	0.8	0.8	82	0.807	0.823	0.942	0.040*	-0.002	0.001	0.001	-0.095	-0.091	100.0
0.5	$R_{\perp\!\!\perp}$	sharp	0.4	0.6	0.8	0.8	82	0.807	0.823	0.941	0.026*	-0.002	0.003	0.002	0.006	0.012	100.0
0.5	$R_{\perp\!\!\perp}$	sharp	0.6	0.4	0.3	0.3	223	0.802	0.615	0.945	0.180	-0.000	-0.002	-0.002	0.013	0.014	100.0
0.5	$R_{\perp\!\!\perp}$	sharp	0.6	0.4	0.3	0.3	223	0.805	0.774	0.950	0.967	0.001	0.003	-0.002	-0.015	-0.006	100.0
0.5	$R_{\perp\!\!\perp}$	sharp	0.6	0.4	0.6	0.6	150	0.804	0.715	0.940	0.013*	-0.001	-0.001	-0.001	0.014	0.012	100.0
0.5	$R_{\perp\!\!\perp}$	sharp	0.6	0.4	0.6	0.6	150	0.799	0.435	0.943	0.094	0.003	-0.002	0.001	0.005	0.001	100.0
0.5	$R_{\perp\!\!\perp}$	sharp	0.6	0.4	0.8	0.8	82	0.819	0.995	0.935	0.000*	-0.003	0.002	0.003	-0.088	-0.084	100.0
0.5	$R_{\perp\!\!\perp}$	sharp	0.6	0.4	0.8	0.8	82	0.792	0.156	0.932	0.000*	0.002	-0.003	-0.002	-0.008	-0.010	99.9
0.5	$R_{\perp\!\!\perp}$	sharp	0.6	0.6	0.3	0.3	223	0.802	0.632	0.943	0.086	0.001	0.003	-0.000	0.031	0.025	100.0
0.5	$R_{\perp\!\!\perp}$	sharp	0.6	0.6	0.3	0.3	223	0.806	0.813	0.950	1.000	0.004	0.001	0.002	0.002	-0.004	100.0
0.5	$R_{\perp\!\!\perp}$	sharp	0.6	0.6	0.6	0.6	150	0.808	0.858	0.946	0.276	0.001	-0.003	-0.002	0.023	0.020	100.0
0.5	$R_{\perp\!\!\perp}$	sharp	0.6	0.6	0.6	0.6	150	0.818	0.993	0.939	0.007*	-0.001	-0.002	-0.001	0.004	0.005	100.0
0.5	$R_{\perp\!\!\perp}$	sharp	0.6	0.6	0.8	0.8	82	0.795	0.265	0.930	0.000*	0.005	0.005	0.006	-0.181	-0.179	100.0
0.5	$R_{\perp\!\!\perp}$	sharp	0.6	0.6	0.8	0.8	82	0.802	0.615	0.932	0.000*	-0.002	-0.002	-0.002	0.006	0.012	100.0

Table S5: Additional simulation results for design I when working assumption A1(a) is violated: responders' end-of-study variance is 25% below the appropriate lower bound.

δ	Response	Formula	r_{-1}	r_1	ρ	ρ_{size}	n	$1-\hat{\beta}$	p value	Coverage	p value	$\text{Cor}(R, Y_0^2)$	$\text{Cor}(R, Y_1^2)$	$\text{Cor}(R, Y_0Y_1)$	$\text{Cov}(Y_0, Y_2)$	$\text{Cov}(Y_1, Y_2)$	% Valid
0.3	R_+	cons.	0.4	0.4	0.0	0.0	698	0.798	0.417	0.951	0.769	0.001	0.077	-0.001	-2.236	14.730	100.0
0.3	R_+	cons.	0.4	0.4	0.3	0.3	635	0.820	0.998	0.947	0.451	0.008	0.078	0.032	-0.014	-0.100	100.0
0.3	R_+	cons.	0.4	0.4	0.6	0.6	447	0.865	1.000	0.948	0.615	0.028	0.078	0.057	-0.050	-0.098	100.0
0.3	R_+	cons.	0.4	0.6	0.0	0.0	698	0.788	0.058	0.947	0.451	-0.001	0.012	-0.001	-110.062	-1.869	100.0
0.3	R_+	cons.	0.4	0.6	0.3	0.3	635	0.832	1.000	0.955	0.258	0.002	0.009	0.005	-0.002	-0.015	100.0
0.3	R_+	cons.	0.4	0.6	0.6	0.6	447	0.848	1.000	0.943	0.071	0.003	0.010	0.009	-0.003	-0.009	100.0
0.3	R_+	cons.	0.6	0.4	0.0	0.0	698	0.790	0.090	0.943	0.071	0.001	0.011	-0.001	-0.117	-2.392	100.0
0.3	R_+	cons.	0.6	0.4	0.3	0.3	635	0.829	1.000	0.953	0.476	0.001	0.009	0.004	0.002	0.005	100.0
0.3	R_+	cons.	0.6	0.4	0.6	0.6	447	0.872	1.000	0.937	0.002*	0.003	0.009	0.007	-0.006	-0.008	100.0
0.3	R_+	cons.	0.6	0.6	0.0	0.0	698	0.800	0.525	0.946	0.315	-0.001	-0.061	-0.001	-3.828	-1.827	100.0
0.3	R_+	cons.	0.6	0.6	0.3	0.3	635	0.824	1.000	0.949	0.801	-0.006	-0.061	-0.024	0.022	0.075	100.0
0.3	R_+	cons.	0.6	0.6	0.6	0.6	447	0.859	1.000	0.946	0.276	-0.022	-0.061	-0.044	0.039	0.085	100.0
0.3	R_+	sharp	0.4	0.4	0.3	0.3	618	0.816	0.987	0.949	0.867	0.007	0.078	0.032	-0.023	-0.098	100.0
0.3	R_+	sharp	0.4	0.4	0.6	0.6	416	0.851	1.000	0.942	0.040*	0.030	0.078	0.058	-0.050	-0.097	100.0
0.3	R_+	sharp	0.4	0.6	0.3	0.3	618	0.802	0.632	0.946	0.315	0.002	0.010	0.005	0.004	-0.005	100.0
0.3	R_+	sharp	0.4	0.6	0.6	0.6	416	0.824	1.000	0.946	0.357	0.003	0.008	0.007	-0.006	-0.011	100.0
0.3	R_+	sharp	0.6	0.4	0.3	0.3	618	0.809	0.896	0.948	0.557	0.003	0.011	0.006	-0.004	-0.012	100.0
0.3	R_+	sharp	0.6	0.4	0.6	0.6	416	0.854	1.000	0.951	0.900	0.006	0.009	0.007	0.004	-0.006	100.0
0.3	R_+	sharp	0.6	0.6	0.3	0.3	618	0.816	0.989	0.942	0.040*	-0.005	-0.059	-0.023	0.013	0.079	100.0
0.3	R_+	sharp	0.6	0.6	0.6	0.6	416	0.837	1.000	0.951	0.900	-0.022	-0.061	-0.044	0.043	0.079	100.0
0.3	R_-	cons.	0.4	0.4	0.0	0.0	698	0.801	0.562	0.957	0.079	0.001	0.079	0.001	1.663	-2.520	100.0
0.3	R_-	cons.	0.4	0.4	0.3	0.3	635	0.792	0.132	0.953	0.426	0.008	0.079	0.031	-0.021	-0.101	100.0
0.3	R_-	cons.	0.4	0.4	0.6	0.6	447	0.757	0.000*	0.949	0.801	0.027	0.079	0.057	-0.051	-0.101	100.0
0.3	R_-	cons.	0.4	0.6	0.0	0.0	698	0.795	0.239	0.953	0.476	-0.001	0.013	0.001	-0.829	1.477	100.0
0.3	R_-	cons.	0.4	0.6	0.3	0.3	635	0.794	0.199	0.950	0.967	0.002	0.011	0.003	-0.015	-0.006	100.0
0.3	R_-	cons.	0.4	0.6	0.6	0.6	447	0.786	0.033*	0.945	0.180	0.004	0.010	0.007	-0.000	-0.005	100.0
0.3	R_-	cons.	0.6	0.4	0.0	0.0	698	0.797	0.365	0.947	0.503	0.001	0.014	0.001	1.385	-18.011	100.0
0.3	R_-	cons.	0.6	0.4	0.3	0.3	635	0.774	0.000*	0.946	0.357	0.000	0.010	0.002	-0.002	-0.018	100.0
0.3	R_-	cons.	0.6	0.4	0.6	0.6	447	0.764	0.000*	0.945	0.241	0.004	0.010	0.007	-0.011	-0.015	100.0
0.3	R_-	cons.	0.6	0.6	0.0	0.0	698	0.801	0.544	0.950	0.933	-0.001	-0.059	0.001	2.766	-1.095	100.0
0.3	R_-	cons.	0.6	0.6	0.3	0.3	635	0.789	0.064	0.944	0.154	-0.006	-0.060	-0.025	0.025	0.088	100.0
0.3	R_-	cons.	0.6	0.6	0.6	0.6	447	0.781	0.005*	0.945	0.180	-0.021	-0.060	-0.044	0.042	0.084	100.0
0.3	R_-	sharp	0.4	0.4	0.3	0.3	618	0.762	0.000*	0.947	0.503	0.007	0.078	0.031	-0.025	-0.103	100.0
0.3	R_-	sharp	0.4	0.4	0.6	0.6	416	0.738	0.000*	0.941	0.021*	0.028	0.079	0.057	-0.051	-0.102	100.0
0.3	R_-	sharp	0.4	0.6	0.3	0.3	618	0.776	0.001*	0.945	0.180	0.001	0.010	0.004	-0.014	-0.011	100.0
0.3	R_-	sharp	0.4	0.6	0.6	0.6	416	0.765	0.000*	0.947	0.451	0.005	0.010	0.007	-0.001	-0.006	100.0
0.3	R_-	sharp	0.6	0.4	0.3	0.3	618	0.757	0.000*	0.950	0.967	0.002	0.009	0.003	-0.002	-0.010	100.0
0.3	R_-	sharp	0.6	0.4	0.6	0.6	416	0.718	0.000*	0.947	0.503	0.004	0.010	0.008	-0.004	-0.009	100.0
0.3	R_-	sharp	0.6	0.6	0.3	0.3	618	0.775	0.000*	0.950	0.933	-0.006	-0.061	-0.026	0.019	0.078	100.0
0.3	R_-	sharp	0.6	0.6	0.6	0.6	416	0.760	0.000*	0.954	0.295	-0.023	-0.059	-0.045	0.042	0.082	100.0
0.3	$R_{\perp\!\!\!\perp}$	cons.	0.4	0.4	0.0	0.0	698	0.797	0.365	0.943	0.094	-0.000	-0.001	0.001	0.565	-0.696	100.0
0.3	$R_{\perp\!\!\!\perp}$	cons.	0.4	0.4	0.0	0.0	698	0.797	0.365	0.943	0.094	-0.000	-0.001	0.001	0.565	-0.696	100.0
0.3	$R_{\perp\!\!\!\perp}$	cons.	0.4	0.4	0.3	0.3	635	0.818	0.993	0.949	0.867	0.002	0.000	-0.000	-0.001	0.004	100.0
0.3	$R_{\perp\!\!\!\perp}$	cons.	0.4	0.4	0.3	0.3	635	0.818	0.993	0.949	0.867	0.002	0.000	-0.000	-0.001	0.004	100.0
0.3	$R_{\perp\!\!\!\perp}$	cons.	0.4	0.4	0.6	0.6	447	0.811	0.938	0.939	0.007*	0.001	-0.001	0.000	-0.001	-0.005	100.0
0.3	$R_{\perp\!\!\!\perp}$	cons.	0.4	0.4	0.6	0.6	447	0.811	0.938	0.939	0.007*	0.001	-0.001	0.000	-0.001	-0.005	100.0

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Additional simulation results for design I when working assumption A1(a) is violated: responders' end-of-study variance is 25% below the appropriate lower bound.

δ	Response	Formula	r_{-1}	r_1	ρ	ρ_{size}	n	$1-\hat{\beta}$	p value	Coverage	p value	$\text{Cor}(R, Y_0^2)$	$\text{Cor}(R, Y_1^2)$	$\text{Cor}(R, Y_0 Y_1)$	$\text{Cov}(Y_0, Y_2)$	$\text{Cov}(Y_1, Y_2)$	% Valid
0.3	$R_{\perp\!\!\!\perp}$	cons.	0.4	0.6	0.0	0.0	698	0.800	0.507	0.954	0.295	-0.001	-0.000	0.002	1.618	-1.290	100.0
0.3	$R_{\perp\!\!\!\perp}$	cons.	0.4	0.6	0.0	0.0	698	0.800	0.507	0.954	0.295	-0.001	-0.000	0.002	1.618	-1.290	100.0
0.3	$R_{\perp\!\!\!\perp}$	cons.	0.4	0.6	0.3	0.3	635	0.797	0.331	0.945	0.241	0.000	0.001	-0.001	-0.003	0.012	100.0
0.3	$R_{\perp\!\!\!\perp}$	cons.	0.4	0.6	0.3	0.3	635	0.797	0.331	0.945	0.241	0.000	0.001	-0.001	-0.003	0.012	100.0
0.3	$R_{\perp\!\!\!\perp}$	cons.	0.4	0.6	0.6	0.6	447	0.821	0.999	0.947	0.402	0.002	-0.002	0.002	0.001	0.001	100.0
0.3	$R_{\perp\!\!\!\perp}$	cons.	0.4	0.6	0.6	0.6	447	0.821	0.999	0.947	0.402	0.002	-0.002	0.002	0.001	0.001	100.0
0.3	$R_{\perp\!\!\!\perp}$	cons.	0.6	0.4	0.0	0.0	698	0.791	0.114	0.948	0.557	0.001	0.000	-0.002	1.619	-0.947	100.0
0.3	$R_{\perp\!\!\!\perp}$	cons.	0.6	0.4	0.0	0.0	698	0.791	0.114	0.948	0.557	0.001	0.000	-0.002	1.619	-0.947	100.0
0.3	$R_{\perp\!\!\!\perp}$	cons.	0.6	0.4	0.3	0.3	635	0.799	0.471	0.948	0.557	-0.000	-0.001	0.001	0.001	0.007	100.0
0.3	$R_{\perp\!\!\!\perp}$	cons.	0.6	0.4	0.3	0.3	635	0.799	0.471	0.948	0.557	-0.000	-0.001	0.001	0.001	0.007	100.0
0.3	$R_{\perp\!\!\!\perp}$	cons.	0.6	0.4	0.6	0.6	447	0.809	0.887	0.942	0.059	-0.002	0.002	-0.002	-0.001	0.002	100.0
0.3	$R_{\perp\!\!\!\perp}$	cons.	0.6	0.4	0.6	0.6	447	0.809	0.887	0.942	0.059	-0.002	0.002	-0.002	-0.001	0.002	100.0
0.3	$R_{\perp\!\!\!\perp}$	cons.	0.6	0.6	0.0	0.0	698	0.789	0.070	0.945	0.209	0.000	0.001	-0.001	1.525	-1.227	100.0
0.3	$R_{\perp\!\!\!\perp}$	cons.	0.6	0.6	0.0	0.0	698	0.789	0.070	0.945	0.209	0.000	0.001	-0.001	1.525	-1.227	100.0
0.3	$R_{\perp\!\!\!\perp}$	cons.	0.6	0.6	0.3	0.3	635	0.809	0.896	0.951	0.900	-0.002	-0.000	0.000	-0.010	0.001	100.0
0.3	$R_{\perp\!\!\!\perp}$	cons.	0.6	0.6	0.3	0.3	635	0.809	0.896	0.951	0.900	-0.002	-0.000	0.000	-0.010	0.001	100.0
0.3	$R_{\perp\!\!\!\perp}$	cons.	0.6	0.6	0.6	0.6	447	0.825	1.000	0.942	0.040*	-0.001	0.001	-0.000	0.002	0.007	100.0
0.3	$R_{\perp\!\!\!\perp}$	cons.	0.6	0.6	0.6	0.6	447	0.825	1.000	0.942	0.040*	-0.001	0.001	-0.000	0.002	0.007	100.0
0.3	$R_{\perp\!\!\!\perp}$	sharp	0.4	0.4	0.3	0.3	618	0.800	0.525	0.947	0.503	-0.001	0.001	0.001	-0.004	0.005	100.0
0.3	$R_{\perp\!\!\!\perp}$	sharp	0.4	0.4	0.3	0.3	618	0.800	0.525	0.947	0.503	-0.001	0.001	0.001	-0.004	0.005	100.0
0.3	$R_{\perp\!\!\!\perp}$	sharp	0.4	0.4	0.6	0.6	416	0.793	0.186	0.957	0.102	0.002	-0.002	0.002	0.003	-0.000	100.0
0.3	$R_{\perp\!\!\!\perp}$	sharp	0.4	0.4	0.6	0.6	416	0.793	0.186	0.957	0.102	0.002	-0.002	0.002	0.003	-0.000	100.0
0.3	$R_{\perp\!\!\!\perp}$	sharp	0.4	0.6	0.3	0.3	618	0.787	0.044*	0.946	0.276	-0.001	-0.002	-0.002	-0.014	-0.007	100.0
0.3	$R_{\perp\!\!\!\perp}$	sharp	0.4	0.6	0.3	0.3	618	0.787	0.044*	0.946	0.276	-0.001	-0.002	-0.002	-0.014	-0.007	100.0
0.3	$R_{\perp\!\!\!\perp}$	sharp	0.4	0.6	0.6	0.6	416	0.788	0.058	0.943	0.086	-0.003	-0.002	-0.002	-0.009	-0.005	100.0
0.3	$R_{\perp\!\!\!\perp}$	sharp	0.4	0.6	0.6	0.6	416	0.788	0.058	0.943	0.086	-0.003	-0.002	-0.002	-0.009	-0.005	100.0
0.3	$R_{\perp\!\!\!\perp}$	sharp	0.6	0.4	0.3	0.3	618	0.790	0.090	0.938	0.003*	0.001	0.002	0.002	0.004	0.005	100.0
0.3	$R_{\perp\!\!\!\perp}$	sharp	0.6	0.4	0.3	0.3	618	0.790	0.090	0.938	0.003*	0.001	0.002	0.002	0.004	0.005	100.0
0.3	$R_{\perp\!\!\!\perp}$	sharp	0.6	0.4	0.6	0.6	416	0.787	0.044*	0.948	0.615	0.003	0.002	0.002	0.008	0.002	100.0
0.3	$R_{\perp\!\!\!\perp}$	sharp	0.6	0.4	0.6	0.6	416	0.787	0.044*	0.948	0.615	0.003	0.002	0.002	0.008	0.002	100.0
0.3	$R_{\perp\!\!\!\perp}$	sharp	0.6	0.6	0.3	0.3	618	0.791	0.114	0.948	0.675	0.001	-0.001	-0.001	0.001	-0.002	100.0
0.3	$R_{\perp\!\!\!\perp}$	sharp	0.6	0.6	0.3	0.3	618	0.791	0.114	0.948	0.675	0.001	-0.001	-0.001	0.001	-0.002	100.0
0.3	$R_{\perp\!\!\!\perp}$	sharp	0.6	0.6	0.6	0.6	416	0.790	0.097	0.946	0.315	-0.002	0.002	-0.002	-0.000	-0.001	100.0
0.3	$R_{\perp\!\!\!\perp}$	sharp	0.6	0.6	0.6	0.6	416	0.790	0.097	0.946	0.315	-0.002	0.002	-0.002	-0.000	-0.001	100.0
0.3	$R_{+}^{1\kappa}$	cons.	0.2	0.4	0.0	0.0	698	0.786	0.033*	0.950	0.967	0.000	0.313	0.002	-6.056	2.602	100.0
0.3	$R_{+}^{1\kappa}$	cons.	0.2	0.4	0.3	0.3	635	0.780	0.004*	0.945	0.241	0.027	0.306	0.122	-0.095	-0.511	100.0
0.3	$R_{+}^{1\kappa}$	cons.	0.2	0.4	0.6	0.6	447	0.755	0.000*	0.948	0.557	0.109	0.308	0.222	-0.229	-0.515	100.0
0.3	$R_{+}^{1\kappa}$	cons.	0.3	0.6	0.0	0.0	698	0.799	0.453	0.948	0.615	-0.001	0.069	0.001	3.767	-1.353	100.0
0.3	$R_{+}^{1\kappa}$	cons.	0.3	0.6	0.3	0.3	635	0.785	0.024*	0.942	0.059	0.005	0.061	0.025	-0.024	-0.122	100.0
0.3	$R_{+}^{1\kappa}$	cons.	0.3	0.6	0.6	0.6	447	0.775	0.000*	0.943	0.071	0.021	0.062	0.044	-0.046	-0.132	100.0
0.3	$R_{+}^{1\kappa}$	sharp	0.2	0.4	0.3	0.3	618	0.766	0.000*	0.945	0.209	0.029	0.309	0.123	-0.086	-0.514	100.0
0.3	$R_{+}^{1\kappa}$	sharp	0.2	0.4	0.6	0.6	416	0.736	0.000*	0.948	0.615	0.109	0.307	0.222	-0.222	-0.512	100.0
0.3	$R_{+}^{1\kappa}$	sharp	0.3	0.6	0.3	0.3	618	0.776	0.001*	0.952	0.706	0.006	0.064	0.025	-0.014	-0.119	100.0
0.3	$R_{+}^{1\kappa}$	sharp	0.3	0.6	0.6	0.6	416	0.747	0.000*	0.940	0.012*	0.022	0.061	0.043	-0.045	-0.129	100.0
0.3	$R_{-}^{1\kappa}$	cons.	0.2	0.4	0.0	0.0	698	0.503	0.000*	0.912	0.000*	-0.001	0.069	0.001	2.392	-1.344	100.0

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Additional simulation results for design I when working assumption A1(a) is violated: responders' end-of-study variance is 25% below the appropriate lower bound.

δ	Response	Formula	r_{-1}	r_1	ρ	ρ_{size}	n	$1-\hat{\beta}$	p value	Coverage	p value	$\text{Cor}(R, Y_0^2)$	$\text{Cor}(R, Y_1^2)$	$\text{Cor}(R, Y_0Y_1)$	$\text{Cov}(Y_0, Y_2)$	$\text{Cov}(Y_1, Y_2)$	% Valid
0.3	$R_-^{1\kappa}$	cons.	0.2	0.4	0.3	0.3	635	0.475	0.000*	0.908	0.000*	0.005	0.061	0.025	-0.022	-0.123	100.0
0.3	$R_-^{1\kappa}$	cons.	0.2	0.4	0.6	0.6	447	0.445	0.000*	0.911	0.000*	0.021	0.062	0.044	-0.046	-0.132	100.0
0.3	$R_-^{1\kappa}$	cons.	0.3	0.6	0.0	0.0	698	0.617	0.000*	0.010	0.000*	0.000	0.313	0.002	-4.926	2.140	100.0
0.3	$R_-^{1\kappa}$	cons.	0.3	0.6	0.3	0.3	635	0.562	0.000*	0.018	0.000*	0.027	0.306	0.122	-0.095	-0.511	100.0
0.3	$R_-^{1\kappa}$	sharp	0.2	0.4	0.3	0.3	618	0.470	0.000*	0.913	0.000*	0.006	0.064	0.025	-0.014	-0.120	100.0
0.3	$R_-^{1\kappa}$	sharp	0.2	0.4	0.6	0.6	416	0.400	0.000*	0.913	0.000*	0.022	0.061	0.043	-0.046	-0.130	100.0
0.3	$R_-^{1\kappa}$	sharp	0.3	0.6	0.3	0.3	618	0.574	0.000*	0.022	0.000*	0.029	0.309	0.123	-0.086	-0.513	100.0
0.3	$R_+^{2\kappa}$	cons.	0.4	0.4	0.0	0.0	698	0.788	0.058	0.939	0.006*	0.000	0.145	0.001	0.674	1.676	100.0
0.3	$R_+^{2\kappa}$	cons.	0.4	0.4	0.3	0.3	635	0.772	0.000*	0.954	0.379	0.013	0.144	0.058	-0.039	-0.274	100.0
0.3	$R_+^{2\kappa}$	cons.	0.4	0.4	0.6	0.6	447	0.743	0.000*	0.949	0.801	0.050	0.144	0.104	-0.103	-0.265	100.0
0.3	$R_+^{2\kappa}$	cons.	0.4	0.6	0.0	0.0	698	0.794	0.199	0.941	0.033*	-0.001	0.006	0.001	2.369	-1.248	100.0
0.3	$R_+^{2\kappa}$	cons.	0.4	0.6	0.3	0.3	635	0.779	0.003*	0.950	0.933	-0.001	0.001	-0.002	-0.001	0.000	100.0
0.3	$R_+^{2\kappa}$	cons.	0.4	0.6	0.6	0.6	447	0.758	0.000*	0.940	0.013*	-0.002	0.000	-0.001	-0.004	0.001	100.0
0.3	$R_+^{2\kappa}$	cons.	0.6	0.4	0.0	0.0	698	0.791	0.105	0.935	0.000*	0.000	0.008	0.001	0.016	-1.176	100.0
0.3	$R_+^{2\kappa}$	cons.	0.6	0.4	0.3	0.3	635	0.780	0.004*	0.945	0.209	-0.000	0.002	-0.001	-0.002	0.006	100.0
0.3	$R_+^{2\kappa}$	cons.	0.6	0.4	0.6	0.6	447	0.738	0.000*	0.947	0.402	-0.001	-0.003	-0.003	-0.001	-0.006	100.0
0.3	$R_+^{2\kappa}$	cons.	0.6	0.6	0.0	0.0	698	0.789	0.076	0.947	0.451	-0.001	-0.143	0.001	1.093	-0.155	100.0
0.3	$R_+^{2\kappa}$	cons.	0.6	0.6	0.3	0.3	635	0.799	0.435	0.951	0.834	-0.013	-0.143	-0.059	0.040	0.360	100.0
0.3	$R_+^{2\kappa}$	cons.	0.6	0.6	0.6	0.6	447	0.753	0.000*	0.937	0.002*	-0.052	-0.145	-0.105	0.108	0.348	100.0
0.3	$R_+^{2\kappa}$	sharp	0.4	0.4	0.3	0.3	618	0.758	0.000*	0.949	0.737	0.013	0.143	0.057	-0.037	-0.256	100.0
0.3	$R_+^{2\kappa}$	sharp	0.4	0.4	0.6	0.6	416	0.716	0.000*	0.951	0.834	0.052	0.144	0.104	-0.102	-0.265	100.0
0.3	$R_+^{2\kappa}$	sharp	0.4	0.6	0.3	0.3	618	0.783	0.010*	0.950	1.000	-0.001	-0.004	-0.003	-0.006	-0.011	100.0
0.3	$R_+^{2\kappa}$	sharp	0.4	0.6	0.6	0.6	416	0.745	0.000*	0.943	0.071	0.000	0.001	-0.001	0.004	-0.004	100.0
0.3	$R_+^{2\kappa}$	sharp	0.6	0.4	0.3	0.3	618	0.766	0.000*	0.955	0.258	0.001	-0.003	-0.001	0.002	-0.006	100.0
0.3	$R_+^{2\kappa}$	sharp	0.6	0.4	0.6	0.6	416	0.727	0.000*	0.949	0.867	-0.002	-0.001	-0.002	-0.003	-0.004	100.0
0.3	$R_+^{2\kappa}$	sharp	0.6	0.6	0.3	0.3	618	0.790	0.097	0.950	1.000	-0.013	-0.144	-0.060	0.039	0.339	100.0
0.3	$R_+^{2\kappa}$	sharp	0.6	0.6	0.6	0.6	416	0.730	0.000*	0.947	0.503	-0.053	-0.143	-0.105	0.110	0.346	100.0
0.3	$R_-^{2\kappa}$	cons.	0.4	0.4	0.0	0.0	698	0.993	1.000	0.733	0.000*	-0.001	-0.143	0.001	1.438	-0.298	100.0
0.3	$R_-^{2\kappa}$	cons.	0.4	0.4	0.3	0.3	635	0.992	1.000	0.716	0.000*	-0.013	-0.143	-0.059	0.040	0.359	100.0
0.3	$R_-^{2\kappa}$	cons.	0.4	0.4	0.6	0.6	447	0.981	1.000	0.727	0.000*	-0.052	-0.145	-0.105	0.108	0.347	100.0
0.3	$R_-^{2\kappa}$	cons.	0.4	0.6	0.0	0.0	698	0.727	0.000*	0.937	0.002*	0.000	0.008	0.001	-0.261	-1.203	100.0
0.3	$R_-^{2\kappa}$	cons.	0.4	0.6	0.3	0.3	635	0.729	0.000*	0.944	0.132	-0.000	0.002	-0.001	-0.000	0.008	100.0
0.3	$R_-^{2\kappa}$	cons.	0.4	0.6	0.6	0.6	447	0.693	0.000*	0.937	0.002*	-0.001	-0.003	-0.003	-0.001	-0.007	100.0
0.3	$R_-^{2\kappa}$	cons.	0.4	0.6	0.8	0.8	252	0.618	0.000*	0.946	0.357	0.001	0.002	0.002	-0.002	0.001	100.0
0.3	$R_-^{2\kappa}$	cons.	0.6	0.4	0.0	0.0	698	0.832	1.000	0.937	0.002*	-0.001	0.006	0.001	2.248	-1.254	100.0
0.3	$R_-^{2\kappa}$	cons.	0.6	0.4	0.3	0.3	635	0.805	0.745	0.944	0.111	-0.001	0.001	-0.002	-0.001	-0.000	100.0
0.3	$R_-^{2\kappa}$	cons.	0.6	0.4	0.6	0.6	447	0.757	0.000*	0.935	0.000*	-0.002	0.000	-0.001	-0.003	0.001	100.0
0.3	$R_-^{2\kappa}$	cons.	0.6	0.6	0.0	0.0	698	0.286	0.000*	0.777	0.000*	0.000	0.145	0.001	0.717	1.591	100.0
0.3	$R_-^{2\kappa}$	cons.	0.6	0.6	0.3	0.3	635	0.268	0.000*	0.785	0.000*	0.013	0.144	0.058	-0.039	-0.275	100.0
0.3	$R_-^{2\kappa}$	cons.	0.6	0.6	0.6	0.6	447	0.252	0.000*	0.807	0.000*	0.050	0.144	0.104	-0.102	-0.265	100.0
0.3	$R_-^{2\kappa}$	sharp	0.4	0.4	0.3	0.3	618	0.988	1.000	0.734	0.000*	-0.013	-0.144	-0.060	0.039	0.340	100.0
0.3	$R_-^{2\kappa}$	sharp	0.4	0.4	0.6	0.6	416	0.979	1.000	0.740	0.000*	-0.053	-0.143	-0.105	0.109	0.346	100.0
0.3	$R_-^{2\kappa}$	sharp	0.4	0.6	0.3	0.3	618	0.707	0.000*	0.953	0.476	0.001	-0.003	-0.001	0.002	-0.006	100.0
0.3	$R_-^{2\kappa}$	sharp	0.4	0.6	0.6	0.6	416	0.674	0.000*	0.949	0.737	-0.002	-0.001	-0.002	-0.002	-0.004	100.0
0.3	$R_-^{2\kappa}$	sharp	0.4	0.6	0.8	0.8	227	0.578	0.000*	0.939	0.006*	-0.005	0.008	0.007	0.004	0.005	100.0

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Additional simulation results for design I when working assumption A1(a) is violated: responders' end-of-study variance is 25% below the appropriate lower bound.

δ	Response	Formula	r_{-1}	r_1	ρ	ρ_{size}	n	$1-\hat{\beta}$	p value	Coverage	p value	$\text{Cor}(R, Y_0^2)$	$\text{Cor}(R, Y_1^2)$	$\text{Cor}(R, Y_0 Y_1)$	$\text{Cov}(Y_0, Y_2)$	$\text{Cov}(Y_1, Y_2)$	% Valid
0.3	$R_-^{2\kappa}$	sharp	0.6	0.4	0.3	0.3	618	0.800	0.507	0.947	0.451	-0.001	-0.004	-0.003	-0.005	-0.011	100.0
0.3	$R_-^{2\kappa}$	sharp	0.6	0.4	0.6	0.6	416	0.741	0.000*	0.939	0.009*	0.000	0.001	-0.001	0.004	-0.004	100.0
0.3	$R_-^{2\kappa}$	sharp	0.6	0.6	0.3	0.3	618	0.265	0.000*	0.784	0.000*	0.013	0.143	0.057	-0.037	-0.256	100.0
0.3	$R_-^{2\kappa}$	sharp	0.6	0.6	0.6	0.6	416	0.241	0.000*	0.817	0.000*	0.052	0.144	0.104	-0.103	-0.265	100.0
0.5	R_+	cons.	0.4	0.4	0.0	0.0	252	0.798	0.417	0.938	0.004*	-0.001	0.079	-0.003	10.442	0.109	100.0
0.5	R_+	cons.	0.4	0.4	0.3	0.3	229	0.814	0.977	0.939	0.007*	0.007	0.079	0.032	-0.018	-0.101	100.0
0.5	R_+	cons.	0.4	0.4	0.6	0.6	161	0.868	1.000	0.935	0.000*	0.031	0.081	0.061	-0.052	-0.101	100.0
0.5	R_+	cons.	0.4	0.4	0.8	0.8	91	0.926	1.000	0.935	0.000*	0.054	0.081	0.072	-0.087	-0.109	100.0
0.5	R_+	cons.	0.4	0.6	0.0	0.0	252	0.802	0.597	0.940	0.012*	-0.002	0.011	-0.002	6.769	0.562	100.0
0.5	R_+	cons.	0.4	0.6	0.3	0.3	229	0.816	0.987	0.943	0.071	-0.002	0.011	0.003	-0.012	-0.023	100.0
0.5	R_+	cons.	0.4	0.6	0.6	0.6	161	0.850	1.000	0.945	0.180	0.008	0.012	0.012	-0.006	-0.005	100.0
0.5	R_+	cons.	0.4	0.6	0.8	0.8	91	0.894	1.000	0.935	0.000*	0.010	0.011	0.012	-0.014	-0.013	100.0
0.5	R_+	cons.	0.6	0.4	0.0	0.0	252	0.797	0.331	0.949	0.737	-0.003	0.010	-0.002	1.000	1.235	100.0
0.5	R_+	cons.	0.6	0.4	0.3	0.3	229	0.828	1.000	0.943	0.071	0.002	0.009	0.003	0.012	-0.010	100.0
0.5	R_+	cons.	0.6	0.4	0.6	0.6	161	0.874	1.000	0.943	0.094	0.005	0.010	0.009	0.001	0.003	100.0
0.5	R_+	cons.	0.6	0.4	0.8	0.8	91	0.923	1.000	0.933	0.000*	0.009	0.015	0.014	-0.019	-0.017	100.0
0.5	R_+	cons.	0.6	0.6	0.0	0.0	252	0.792	0.152	0.942	0.049*	-0.004	-0.060	-0.002	-0.691	-1.242	100.0
0.5	R_+	cons.	0.6	0.6	0.3	0.3	229	0.811	0.943	0.950	0.933	-0.009	-0.061	-0.026	-0.002	0.047	100.0
0.5	R_+	cons.	0.6	0.6	0.6	0.6	161	0.861	1.000	0.941	0.026*	-0.021	-0.060	-0.041	0.045	0.087	100.0
0.5	R_+	cons.	0.6	0.6	0.8	0.8	91	0.896	1.000	0.940	0.013*	-0.038	-0.060	-0.052	0.056	0.078	100.0
0.5	R_+	sharp	0.4	0.4	0.3	0.3	223	0.816	0.987	0.953	0.426	0.007	0.077	0.032	-0.029	-0.104	100.0
0.5	R_+	sharp	0.4	0.4	0.6	0.6	150	0.841	1.000	0.945	0.180	0.030	0.082	0.060	-0.053	-0.102	100.0
0.5	R_+	sharp	0.4	0.4	0.8	0.8	82	0.896	1.000	0.947	0.476	0.052	0.082	0.073	-0.091	-0.114	99.9
0.5	R_+	sharp	0.4	0.6	0.3	0.3	223	0.813	0.965	0.942	0.049*	0.002	0.009	0.004	0.007	-0.013	100.0
0.5	R_+	sharp	0.4	0.6	0.6	0.6	150	0.836	1.000	0.944	0.111	0.006	0.015	0.012	-0.003	-0.006	100.0
0.5	R_+	sharp	0.4	0.6	0.8	0.8	82	0.865	1.000	0.937	0.002*	0.008	0.013	0.010	-0.017	-0.010	99.9
0.5	R_+	sharp	0.6	0.4	0.3	0.3	223	0.815	0.980	0.942	0.059	0.004	0.008	0.004	-0.000	-0.024	100.0
0.5	R_+	sharp	0.6	0.4	0.6	0.6	150	0.839	1.000	0.936	0.000*	0.003	0.009	0.007	-0.004	-0.008	100.0
0.5	R_+	sharp	0.6	0.4	0.8	0.8	82	0.888	1.000	0.937	0.002*	0.007	0.013	0.010	-0.014	-0.013	100.0
0.5	R_+	sharp	0.6	0.6	0.3	0.3	223	0.805	0.760	0.940	0.017*	-0.004	-0.061	-0.024	0.031	0.086	100.0
0.5	R_+	sharp	0.6	0.6	0.6	0.6	150	0.834	1.000	0.947	0.451	-0.023	-0.064	-0.045	0.041	0.078	100.0
0.5	R_+	sharp	0.6	0.6	0.8	0.8	82	0.870	1.000	0.938	0.004*	-0.037	-0.062	-0.053	0.064	0.087	100.0
0.5	R_-	cons.	0.4	0.4	0.0	0.0	252	0.799	0.435	0.953	0.530	0.004	0.079	0.001	3.910	0.248	100.0
0.5	R_-	cons.	0.4	0.4	0.3	0.3	229	0.791	0.105	0.946	0.357	0.009	0.079	0.033	-0.024	-0.098	100.0
0.5	R_-	cons.	0.4	0.4	0.6	0.6	161	0.781	0.006*	0.937	0.002*	0.026	0.078	0.054	-0.058	-0.113	100.0
0.5	R_-	cons.	0.4	0.4	0.8	0.8	91	0.730	0.000*	0.935	0.000*	0.051	0.080	0.070	-0.066	-0.098	100.0
0.5	R_-	cons.	0.4	0.6	0.0	0.0	252	0.794	0.225	0.945	0.241	0.004	0.009	0.001	2.011	2.250	100.0
0.5	R_-	cons.	0.4	0.6	0.3	0.3	229	0.791	0.114	0.938	0.003*	0.001	0.010	0.006	-0.011	-0.001	100.0
0.5	R_-	cons.	0.4	0.6	0.6	0.6	161	0.799	0.435	0.943	0.086	0.002	0.011	0.007	-0.014	-0.017	100.0
0.5	R_-	cons.	0.4	0.6	0.8	0.8	91	0.771	0.000*	0.938	0.004*	0.005	0.011	0.007	0.002	-0.002	99.9
0.5	R_-	cons.	0.6	0.4	0.0	0.0	252	0.794	0.199	0.939	0.006*	0.002	0.010	0.001	0.155	1.211	100.0
0.5	R_-	cons.	0.6	0.4	0.3	0.3	229	0.789	0.070	0.935	0.000*	0.001	0.011	0.006	-0.002	-0.012	100.0
0.5	R_-	cons.	0.6	0.4	0.6	0.6	161	0.788	0.053	0.947	0.451	0.003	0.012	0.007	-0.013	-0.014	100.0
0.5	R_-	cons.	0.6	0.4	0.8	0.8	91	0.757	0.000*	0.941	0.026*	0.011	0.012	0.012	0.010	0.000	100.0
0.5	R_-	cons.	0.6	0.6	0.0	0.0	252	0.810	0.925	0.946	0.357	0.001	-0.062	0.002	1.356	-0.222	100.0

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Additional simulation results for design I when working assumption A1(a) is violated: responders' end-of-study variance is 25% below the appropriate lower bound.

δ	Response	Formula	r_{-1}	r_1	ρ	ρ_{size}	n	$1-\hat{\beta}$	p value	Coverage	p value	$\text{Cor}(R, Y_0^2)$	$\text{Cor}(R, Y_1^2)$	$\text{Cor}(R, Y_0 Y_1)$	$\text{Cov}(Y_0, Y_2)$	$\text{Cov}(Y_1, Y_2)$	% Valid
0.5	R_-	cons.	0.6	0.6	0.3	0.3	229	0.809	0.904	0.946	0.276	-0.006	-0.060	-0.025	0.022	0.079	100.0
0.5	R_-	cons.	0.6	0.6	0.6	0.6	161	0.795	0.239	0.943	0.094	-0.025	-0.063	-0.049	0.038	0.076	100.0
0.5	R_-	cons.	0.6	0.6	0.8	0.8	91	0.765	0.000*	0.937	0.001*	-0.042	-0.060	-0.055	0.085	0.100	99.9
0.5	R_-	sharp	0.4	0.4	0.3	0.3	223	0.778	0.002*	0.944	0.132	0.007	0.080	0.032	-0.027	-0.103	100.0
0.5	R_-	sharp	0.4	0.4	0.6	0.6	150	0.763	0.000*	0.941	0.033*	0.028	0.081	0.058	-0.053	-0.109	100.0
0.5	R_-	sharp	0.4	0.4	0.8	0.8	82	0.703	0.000*	0.930	0.000*	0.051	0.081	0.070	-0.073	-0.108	99.9
0.5	R_-	sharp	0.4	0.6	0.3	0.3	223	0.792	0.142	0.946	0.315	0.002	0.011	0.005	0.009	-0.012	100.0
0.5	R_-	sharp	0.4	0.6	0.6	0.6	150	0.769	0.000*	0.939	0.009*	0.003	0.012	0.008	-0.002	-0.007	100.0
0.5	R_-	sharp	0.4	0.6	0.8	0.8	82	0.732	0.000*	0.942	0.040*	0.006	0.010	0.009	0.006	-0.005	99.9
0.5	R_-	sharp	0.6	0.4	0.3	0.3	223	0.774	0.000*	0.947	0.451	0.001	0.013	0.004	-0.014	-0.028	100.0
0.5	R_-	sharp	0.6	0.4	0.6	0.6	150	0.758	0.000*	0.939	0.007*	0.004	0.014	0.008	-0.016	-0.016	100.0
0.5	R_-	sharp	0.6	0.4	0.8	0.8	82	0.716	0.000*	0.930	0.000*	0.009	0.009	0.010	0.006	-0.006	100.0
0.5	R_-	sharp	0.6	0.6	0.3	0.3	223	0.799	0.471	0.949	0.867	-0.005	-0.058	-0.024	0.016	0.083	100.0
0.5	R_-	sharp	0.6	0.6	0.6	0.6	150	0.762	0.000*	0.942	0.040*	-0.024	-0.063	-0.046	0.038	0.084	100.0
0.5	R_-	sharp	0.6	0.6	0.8	0.8	82	0.721	0.000*	0.930	0.000*	-0.041	-0.063	-0.056	0.073	0.089	99.9

Table S6: Additional simulation results for design I when working assumption A1(b) is violated: response is highly correlated with $(Y_1^{(d)} - \mu_1^{(d)})^2$

δ	Response	Formula	r_{-1}	r_1	ρ	ρ_{size}	n	$1-\hat{\beta}$	p value	Coverage	p value	$\text{Cor}(R, Y_0^2)$	$\text{Cor}(R, Y_1^2)$	$\text{Cor}(R, Y_0Y_1)$	$\text{Cov}(Y_0, Y_2)$	$\text{Cov}(Y_1, Y_2)$	% Valid
0.3	R_+^2	cons.	0.4	0.4	0.0	0.0	698	0.796	0.299	0.944	0.111	-0.000	0.687	0.001	2.542	-1.575	100.0
0.3	R_+^2	cons.	0.4	0.4	0.3	0.3	635	0.804	0.715	0.948	0.615	0.061	0.686	0.276	0.775	9.173	100.0
0.3	R_+^2	cons.	0.4	0.4	0.6	0.6	447	0.817	0.990	0.946	0.315	0.245	0.690	0.499	2.224	9.146	100.0
0.3	R_+^2	cons.	0.4	0.6	0.0	0.0	698	0.798	0.399	0.945	0.209	0.000	0.612	0.001	-1.282	1.678	100.0
0.3	R_+^2	cons.	0.4	0.6	0.3	0.3	635	0.811	0.932	0.951	0.769	0.054	0.609	0.245	0.705	11.667	100.0
0.3	R_+^2	cons.	0.4	0.6	0.6	0.6	447	0.823	0.999	0.946	0.357	0.218	0.613	0.443	2.150	11.578	100.0
0.3	R_+^2	cons.	0.6	0.4	0.0	0.0	698	0.792	0.152	0.946	0.357	-0.001	0.613	0.001	-2.017	40.017	100.0
0.3	R_+^2	cons.	0.6	0.4	0.3	0.3	635	0.792	0.142	0.952	0.706	0.055	0.609	0.245	0.699	11.569	100.0
0.3	R_+^2	cons.	0.6	0.4	0.6	0.6	447	0.828	1.000	0.938	0.004*	0.218	0.611	0.443	2.130	11.502	100.0
0.3	R_+^2	cons.	0.6	0.6	0.0	0.0	698	0.791	0.105	0.942	0.040*	-0.001	0.532	0.001	-0.927	-0.459	100.0
0.3	R_+^2	cons.	0.6	0.6	0.3	0.3	635	0.805	0.745	0.949	0.801	0.048	0.531	0.214	0.644	17.538	100.0
0.3	R_+^2	cons.	0.6	0.6	0.6	0.6	447	0.831	1.000	0.942	0.049*	0.191	0.534	0.386	2.016	17.045	100.0
0.3	R_+^2	sharp	0.4	0.4	0.3	0.3	618	0.786	0.030*	0.941	0.026*	0.061	0.688	0.277	0.770	9.035	100.0
0.3	R_+^2	sharp	0.4	0.4	0.6	0.6	416	0.800	0.489	0.943	0.086	0.248	0.690	0.499	2.225	9.141	100.0
0.3	R_+^2	sharp	0.4	0.6	0.3	0.3	618	0.794	0.225	0.950	0.933	0.054	0.612	0.246	0.700	11.497	100.0
0.3	R_+^2	sharp	0.4	0.6	0.6	0.6	416	0.814	0.972	0.945	0.180	0.220	0.612	0.443	2.135	11.494	100.0
0.3	R_+^2	sharp	0.6	0.4	0.3	0.3	618	0.790	0.083	0.948	0.615	0.054	0.610	0.246	0.706	11.568	100.0
0.3	R_+^2	sharp	0.6	0.4	0.6	0.6	416	0.802	0.615	0.954	0.295	0.220	0.613	0.443	2.144	11.510	100.0
0.3	R_+^2	sharp	0.6	0.6	0.3	0.3	618	0.815	0.980	0.952	0.706	0.047	0.533	0.215	0.628	17.519	100.0
0.3	R_+^2	sharp	0.6	0.6	0.6	0.6	416	0.800	0.507	0.944	0.154	0.192	0.534	0.387	2.032	17.123	100.0
0.3	R_-^2	cons.	0.4	0.4	0.0	0.0	698	1.000	1.000	0.278	0.000*	0.000	-0.422	-0.002	1.455	4.183	100.0
0.3	R_-^2	cons.	0.4	0.4	0.3	0.3	635	1.000	1.000	0.331	0.000*	-0.038	-0.421	-0.169	0.142	1.648	100.0
0.3	R_-^2	cons.	0.4	0.6	0.0	0.0	698	0.977	1.000	0.781	0.000*	0.000	-0.355	-0.001	-1.562	2.041	100.0
0.3	R_-^2	cons.	0.4	0.6	0.3	0.3	635	0.967	1.000	0.793	0.000*	-0.032	-0.353	-0.141	0.106	1.241	100.0
0.3	R_-^2	cons.	0.6	0.4	0.0	0.0	698	0.998	1.000	0.497	0.000*	0.001	-0.357	-0.001	1.714	0.783	100.0
0.3	R_-^2	cons.	0.6	0.4	0.3	0.3	635	0.996	1.000	0.496	0.000*	-0.032	-0.353	-0.142	0.106	1.221	100.0
0.3	R_-^2	cons.	0.6	0.6	0.0	0.0	698	0.932	1.000	0.897	0.000*	0.001	-0.286	-0.001	-0.089	-1.619	100.0
0.3	R_-^2	cons.	0.6	0.6	0.3	0.3	635	0.944	1.000	0.906	0.000*	-0.026	-0.285	-0.115	0.086	0.857	100.0
0.3	R_-^2	sharp	0.4	0.4	0.3	0.3	618	0.999	1.000	0.341	0.000*	-0.038	-0.420	-0.168	0.135	1.691	100.0
0.3	R_-^2	sharp	0.4	0.6	0.3	0.3	618	0.976	1.000	0.786	0.000*	-0.032	-0.354	-0.142	0.102	1.217	100.0
0.3	R_-^2	sharp	0.6	0.4	0.3	0.3	618	0.998	1.000	0.496	0.000*	-0.032	-0.352	-0.141	0.114	1.236	100.0
0.3	R_-^2	sharp	0.6	0.6	0.3	0.3	618	0.937	1.000	0.890	0.000*	-0.026	-0.285	-0.114	0.082	0.867	100.0
0.5	R_+^2	cons.	0.4	0.4	0.0	0.0	252	0.801	0.562	0.951	0.834	-0.002	0.695	-0.002	-1.868	1.491	100.0
0.5	R_+^2	cons.	0.4	0.4	0.3	0.3	229	0.811	0.932	0.950	1.000	0.062	0.698	0.276	0.766	8.951	100.0
0.5	R_+^2	cons.	0.4	0.4	0.6	0.6	161	0.833	1.000	0.945	0.209	0.248	0.702	0.506	2.228	9.254	100.0
0.5	R_+^2	cons.	0.4	0.6	0.0	0.0	252	0.797	0.331	0.945	0.180	-0.002	0.617	-0.002	-8.931	-13.084	100.0
0.5	R_+^2	cons.	0.4	0.6	0.3	0.3	229	0.819	0.995	0.943	0.086	0.053	0.622	0.246	0.706	11.237	100.0
0.5	R_+^2	cons.	0.4	0.6	0.6	0.6	161	0.834	1.000	0.943	0.094	0.220	0.625	0.450	2.143	11.509	100.0
0.5	R_+^2	cons.	0.6	0.4	0.0	0.0	252	0.799	0.453	0.955	0.224	-0.003	0.617	-0.001	-1.532	-0.613	100.0
0.5	R_+^2	cons.	0.6	0.4	0.3	0.3	229	0.788	0.053	0.937	0.001*	0.056	0.620	0.247	0.676	11.415	100.0
0.5	R_+^2	cons.	0.6	0.4	0.6	0.6	161	0.811	0.938	0.939	0.006*	0.220	0.624	0.450	2.144	11.601	100.0
0.5	R_+^2	cons.	0.6	0.6	0.0	0.0	252	0.802	0.597	0.946	0.276	-0.003	0.539	-0.001	1.038	-2.668	100.0
0.5	R_+^2	cons.	0.6	0.6	0.3	0.3	229	0.823	0.999	0.949	0.801	0.047	0.541	0.216	0.632	17.131	100.0
0.5	R_+^2	cons.	0.6	0.6	0.6	0.6	161	0.832	1.000	0.949	0.737	0.192	0.544	0.394	2.012	17.313	100.0
0.5	R_+^2	sharp	0.4	0.4	0.3	0.3	223	0.793	0.163	0.948	0.557	0.063	0.699	0.277	0.758	9.071	100.0

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Additional simulation results for design I when working assumption A1(b) is violated: response is highly correlated with $(Y_1^{(d)} - \mu_1^{(d)})^2$

δ	Response	Formula	r_{-1}	r_1	ρ	ρ_{size}	n	$1-\hat{\beta}$	p value	Coverage	p value	Cor(R, Y_0^2)	Cor(R, Y_1^2)	Cor$(R, Y_0 Y_1)$	Cov(Y_0, Y_2)	Cov(Y_1, Y_2)	% Valid
0.5	R_+^2	sharp	0.4	0.4	0.6	0.6	150	0.787	0.036*	0.931	0.000*	0.247	0.704	0.507	2.223	9.164	100.0
0.5	R_+^2	sharp	0.4	0.6	0.3	0.3	223	0.791	0.123	0.943	0.071	0.055	0.621	0.246	0.696	11.096	100.0
0.5	R_+^2	sharp	0.4	0.6	0.6	0.6	150	0.803	0.666	0.948	0.557	0.221	0.628	0.453	2.134	11.586	100.0
0.5	R_+^2	sharp	0.6	0.4	0.3	0.3	223	0.792	0.142	0.944	0.132	0.054	0.620	0.247	0.688	11.585	100.0
0.5	R_+^2	sharp	0.6	0.4	0.6	0.6	150	0.785	0.022*	0.941	0.021*	0.219	0.627	0.451	2.109	11.586	100.0
0.5	R_+^2	sharp	0.6	0.6	0.3	0.3	223	0.800	0.507	0.944	0.132	0.047	0.542	0.216	0.609	17.692	100.0
0.5	R_+^2	sharp	0.6	0.6	0.6	0.6	150	0.790	0.090	0.943	0.094	0.193	0.548	0.395	1.968	17.396	100.0
0.5	R_-^2	cons.	0.4	0.4	0.0	0.0	252	0.990	1.000	0.661	0.000*	0.002	-0.425	0.001	-1.936	4.827	100.0
0.5	R_-^2	cons.	0.4	0.4	0.3	0.3	229	0.982	1.000	0.689	0.000*	-0.038	-0.427	-0.171	0.147	1.700	100.0
0.5	R_-^2	cons.	0.4	0.6	0.0	0.0	252	0.941	1.000	0.878	0.000*	0.002	-0.357	0.001	-2.046	-0.134	100.0
0.5	R_-^2	cons.	0.4	0.6	0.3	0.3	229	0.926	1.000	0.881	0.000*	-0.033	-0.360	-0.144	0.124	1.321	100.0
0.5	R_-^2	cons.	0.6	0.4	0.0	0.0	252	0.974	1.000	0.759	0.000*	0.002	-0.356	-0.001	-1.615	0.185	100.0
0.5	R_-^2	cons.	0.6	0.4	0.3	0.3	229	0.981	1.000	0.778	0.000*	-0.031	-0.360	-0.146	0.128	1.206	100.0
0.5	R_-^2	cons.	0.6	0.6	0.0	0.0	252	0.896	1.000	0.923	0.000*	0.002	-0.288	-0.001	1.074	-1.343	100.0
0.5	R_-^2	cons.	0.6	0.6	0.3	0.3	229	0.912	1.000	0.923	0.000*	-0.026	-0.289	-0.118	0.072	0.875	100.0
0.5	R_-^2	sharp	0.4	0.4	0.3	0.3	223	0.980	1.000	0.694	0.000*	-0.037	-0.428	-0.169	0.138	1.669	100.0
0.5	R_-^2	sharp	0.4	0.6	0.3	0.3	223	0.916	1.000	0.891	0.000*	-0.031	-0.359	-0.141	0.111	1.230	100.0
0.5	R_-^2	sharp	0.6	0.4	0.3	0.3	223	0.972	1.000	0.776	0.000*	-0.029	-0.360	-0.141	0.120	1.270	100.0
0.5	R_-^2	sharp	0.6	0.6	0.3	0.3	223	0.899	1.000	0.934	0.000*	-0.024	-0.291	-0.114	0.072	0.853	100.0

Table S7: Additional simulation results for design I when working assumption A1(c) is violated.

δ	Response	Formula	r_{-1}	r_1	ρ	ρ_{size}	n	$1-\hat{\beta}$	p value	Coverage	p value	$\text{Cor}(R, Y_0^2)$	$\text{Cor}(R, Y_1^2)$	$\text{Cor}(R, Y_0Y_1)$	$\text{Cov}(Y_0, Y_2)$	$\text{Cov}(Y_1, Y_2)$	% Valid
0.3	$R_{\perp\!\!\!\perp}$	cons.	0.4	0.4	0.3	0.3	635	0.815	0.982	0.950	1.000	-0.001	0.001	0.000	2.476	2.535	100.0
0.3	$R_{\perp\!\!\!\perp}$	cons.	0.4	0.4	0.6	0.6	447	0.827	1.000	0.949	0.867	-0.001	-0.001	-0.001	0.485	0.488	100.0
0.3	$R_{\perp\!\!\!\perp}$	cons.	0.4	0.4	0.8	0.8	252	0.840	1.000	0.948	0.557	-0.003	-0.002	-0.003	0.162	0.161	100.0
0.3	$R_{\perp\!\!\!\perp}$	cons.	0.4	0.6	0.3	0.3	635	0.807	0.848	0.949	0.801	-0.001	-0.001	-0.001	2.035	2.071	100.0
0.3	$R_{\perp\!\!\!\perp}$	cons.	0.4	0.6	0.6	0.6	447	0.829	1.000	0.942	0.040*	0.001	-0.001	0.000	0.696	0.690	100.0
0.3	$R_{\perp\!\!\!\perp}$	cons.	0.4	0.6	0.8	0.8	252	0.829	1.000	0.943	0.071	0.003	0.003	0.003	0.219	0.222	100.0
0.3	$R_{\perp\!\!\!\perp}$	cons.	0.6	0.4	0.3	0.3	635	0.810	0.912	0.945	0.209	-0.001	0.003	0.001	2.078	2.099	100.0
0.3	$R_{\perp\!\!\!\perp}$	cons.	0.6	0.4	0.6	0.6	447	0.841	1.000	0.949	0.737	-0.001	-0.001	0.000	0.687	0.697	100.0
0.3	$R_{\perp\!\!\!\perp}$	cons.	0.6	0.4	0.8	0.8	252	0.859	1.000	0.951	0.900	-0.000	0.001	0.000	0.217	0.215	100.0
0.3	$R_{\perp\!\!\!\perp}$	cons.	0.6	0.6	0.3	0.3	635	0.807	0.848	0.951	0.834	0.001	0.001	-0.001	1.640	1.639	100.0
0.3	$R_{\perp\!\!\!\perp}$	cons.	0.6	0.6	0.6	0.6	447	0.838	1.000	0.947	0.503	-0.000	-0.001	0.001	0.962	0.962	100.0
0.3	$R_{\perp\!\!\!\perp}$	cons.	0.6	0.6	0.8	0.8	252	0.835	1.000	0.940	0.013*	0.002	-0.002	-0.001	0.267	0.265	100.0
0.3	$R_{\perp\!\!\!\perp}$	sharp	0.4	0.4	0.3	0.3	618	0.799	0.453	0.947	0.503	0.001	0.001	-0.000	2.474	2.528	100.0
0.3	$R_{\perp\!\!\!\perp}$	sharp	0.4	0.4	0.6	0.6	416	0.813	0.961	0.943	0.071	0.001	0.001	0.001	0.486	0.485	100.0
0.3	$R_{\perp\!\!\!\perp}$	sharp	0.4	0.4	0.8	0.8	227	0.818	0.994	0.945	0.180	0.003	0.002	0.003	0.171	0.166	100.0
0.3	$R_{\perp\!\!\!\perp}$	sharp	0.4	0.6	0.3	0.3	618	0.803	0.650	0.946	0.276	0.002	0.001	0.001	2.085	2.148	100.0
0.3	$R_{\perp\!\!\!\perp}$	sharp	0.4	0.6	0.6	0.6	416	0.803	0.666	0.940	0.013*	0.000	-0.002	-0.002	0.695	0.685	100.0
0.3	$R_{\perp\!\!\!\perp}$	sharp	0.4	0.6	0.8	0.8	227	0.789	0.076	0.946	0.276	0.003	0.001	0.001	0.219	0.216	100.0
0.3	$R_{\perp\!\!\!\perp}$	sharp	0.6	0.4	0.3	0.3	618	0.810	0.925	0.949	0.867	-0.002	0.001	-0.002	2.063	2.049	100.0
0.3	$R_{\perp\!\!\!\perp}$	sharp	0.6	0.4	0.6	0.6	416	0.797	0.365	0.945	0.241	-0.001	-0.001	-0.000	0.691	0.696	100.0
0.3	$R_{\perp\!\!\!\perp}$	sharp	0.6	0.4	0.8	0.8	227	0.815	0.982	0.946	0.315	-0.002	-0.001	-0.002	0.206	0.208	100.0
0.3	$R_{\perp\!\!\!\perp}$	sharp	0.6	0.6	0.3	0.3	618	0.790	0.090	0.947	0.503	-0.001	0.002	0.001	1.682	1.697	100.0
0.3	$R_{\perp\!\!\!\perp}$	sharp	0.6	0.6	0.6	0.6	416	0.804	0.730	0.945	0.180	-0.002	-0.001	-0.002	0.956	0.962	100.0
0.3	$R_{\perp\!\!\!\perp}$	sharp	0.6	0.6	0.8	0.8	227	0.804	0.699	0.945	0.241	0.000	0.002	0.001	0.269	0.273	100.0
0.5	$R_{\perp\!\!\!\perp}$	cons.	0.4	0.4	0.3	0.3	229	0.814	0.977	0.946	0.276	0.002	0.001	0.002	2.476	2.532	100.0
0.5	$R_{\perp\!\!\!\perp}$	cons.	0.4	0.4	0.6	0.6	161	0.843	1.000	0.943	0.086	-0.002	-0.003	-0.003	0.473	0.472	100.0
0.5	$R_{\perp\!\!\!\perp}$	cons.	0.4	0.4	0.8	0.8	91	0.839	1.000	0.942	0.040*	0.002	0.006	0.004	0.166	0.164	100.0
0.5	$R_{\perp\!\!\!\perp}$	cons.	0.4	0.6	0.3	0.3	229	0.816	0.989	0.942	0.059	-0.001	0.002	-0.004	2.044	2.090	100.0
0.5	$R_{\perp\!\!\!\perp}$	cons.	0.4	0.6	0.6	0.6	161	0.834	1.000	0.948	0.615	0.003	0.004	0.003	0.697	0.699	100.0
0.5	$R_{\perp\!\!\!\perp}$	cons.	0.4	0.6	0.8	0.8	91	0.837	1.000	0.936	0.001*	-0.001	0.001	0.001	0.204	0.202	99.9
0.5	$R_{\perp\!\!\!\perp}$	cons.	0.6	0.4	0.3	0.3	229	0.814	0.972	0.952	0.586	0.003	0.002	0.002	2.134	2.152	100.0
0.5	$R_{\perp\!\!\!\perp}$	cons.	0.6	0.4	0.6	0.6	161	0.828	1.000	0.937	0.002*	-0.002	-0.002	-0.002	0.688	0.695	100.0
0.5	$R_{\perp\!\!\!\perp}$	cons.	0.6	0.4	0.8	0.8	91	0.852	1.000	0.939	0.009*	-0.004	-0.001	-0.001	0.210	0.211	100.0
0.5	$R_{\perp\!\!\!\perp}$	cons.	0.6	0.6	0.3	0.3	229	0.823	0.999	0.952	0.586	0.001	0.002	-0.004	1.607	1.647	100.0
0.5	$R_{\perp\!\!\!\perp}$	cons.	0.6	0.6	0.6	0.6	161	0.837	1.000	0.942	0.059	0.001	0.003	0.002	0.987	0.987	100.0
0.5	$R_{\perp\!\!\!\perp}$	cons.	0.6	0.6	0.8	0.8	91	0.859	1.000	0.939	0.007*	0.004	0.001	0.004	0.287	0.286	100.0
0.5	$R_{\perp\!\!\!\perp}$	sharp	0.4	0.4	0.3	0.3	223	0.806	0.800	0.949	0.867	0.000	0.002	0.003	2.550	2.504	100.0
0.5	$R_{\perp\!\!\!\perp}$	sharp	0.4	0.4	0.6	0.6	150	0.814	0.972	0.929	0.000*	0.001	-0.003	-0.001	0.488	0.480	100.0
0.5	$R_{\perp\!\!\!\perp}$	sharp	0.4	0.4	0.8	0.8	82	0.809	0.891	0.940	0.011*	0.003	0.002	0.002	0.167	0.168	99.9
0.5	$R_{\perp\!\!\!\perp}$	sharp	0.4	0.6	0.3	0.3	223	0.802	0.632	0.947	0.451	0.003	-0.005	0.005	2.060	2.023	100.0
0.5	$R_{\perp\!\!\!\perp}$	sharp	0.4	0.6	0.6	0.6	150	0.795	0.268	0.938	0.003*	0.002	0.002	0.003	0.721	0.706	100.0
0.5	$R_{\perp\!\!\!\perp}$	sharp	0.4	0.6	0.8	0.8	82	0.813	0.964	0.929	0.000*	0.003	0.005	0.004	0.212	0.218	100.0
0.5	$R_{\perp\!\!\!\perp}$	sharp	0.6	0.4	0.3	0.3	223	0.808	0.878	0.942	0.040*	-0.002	-0.002	-0.001	2.063	2.101	100.0
0.5	$R_{\perp\!\!\!\perp}$	sharp	0.6	0.4	0.6	0.6	150	0.804	0.730	0.951	0.900	0.003	-0.002	0.001	0.704	0.681	100.0
0.5	$R_{\perp\!\!\!\perp}$	sharp	0.6	0.4	0.8	0.8	82	0.807	0.835	0.930	0.000*	-0.001	-0.005	-0.003	0.225	0.228	100.0
0.5	$R_{\perp\!\!\!\perp}$	sharp	0.6	0.6	0.3	0.3	223	0.815	0.980	0.943	0.086	0.001	0.003	0.001	1.695	1.700	100.0
0.5	$R_{\perp\!\!\!\perp}$	sharp	0.6	0.6	0.6	0.6	150	0.802	0.632	0.934	0.000*	0.004	-0.005	-0.002	0.980	0.970	100.0

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Additional simulation results for design I when working assumption A1(c) is violated.

δ	Response	Formula	r_{-1}	r_1	ρ	ρ_{size}	n	$1-\hat{\beta}$	p value	Coverage	p value	$\text{Cor}(R, Y_0^2)$	$\text{Cor}(R, Y_1^2)$	$\text{Cor}(R, Y_0 Y_1)$	$\text{Cov}(Y_0, Y_2)$	$\text{Cov}(Y_1, Y_2)$	% Valid
0.5	$R_{\perp\!\!\!\perp}$	sharp	0.6	0.6	0.8	0.8	82	0.825	1.000	0.935	0.000*	0.006	0.005	0.006	0.288	0.279	100.0

Table S8: Additional simulation results for design I when working assumption A2 is violated: the true within-person correlation structure is AR(1) with correlation ρ

δ	Response	Formula	r_{-1}	r_1	ρ	ρ_{size}	n	$1-\hat{\beta}$	p value	Coverage	p value	$\text{Cor}(R, Y_0^2)$	$\text{Cor}(R, Y_1^2)$	$\text{Cor}(R, Y_0Y_1)$	$\text{Cov}(Y_0, Y_2)$	$\text{Cov}(Y_1, Y_2)$	% Valid
0.3	R_+	cons.	0.4	0.4	0.0	0.0	698	0.807	0.848	0.955	0.258	0.001	0.077	-0.001	-2.906	23.178	100.0
0.3	R_+	cons.	0.4	0.4	0.3	0.3	635	0.780	0.004*	0.949	0.801	0.008	0.078	0.032	-0.071	-0.102	100.0
0.3	R_+	cons.	0.4	0.4	0.6	0.6	447	0.728	0.000*	0.948	0.675	0.028	0.078	0.057	-0.093	-0.095	100.0
0.3	R_+	cons.	0.4	0.4	0.8	0.8	252	0.721	0.000*	0.947	0.402	0.051	0.078	0.069	-0.102	-0.101	100.0
0.3	R_+	cons.	0.4	0.6	0.0	0.0	698	0.784	0.016*	0.945	0.209	-0.001	0.012	-0.001	-27.792	-2.362	100.0
0.3	R_+	cons.	0.4	0.6	0.3	0.3	635	0.781	0.006*	0.956	0.167	0.002	0.009	0.005	-0.011	-0.016	100.0
0.3	R_+	cons.	0.4	0.6	0.6	0.6	447	0.721	0.000*	0.947	0.402	0.003	0.010	0.009	-0.004	-0.010	100.0
0.3	R_+	cons.	0.4	0.6	0.8	0.8	252	0.707	0.000*	0.944	0.132	0.007	0.010	0.008	-0.007	-0.007	100.0
0.3	R_+	cons.	0.6	0.4	0.0	0.0	698	0.793	0.186	0.941	0.026*	0.001	0.011	-0.001	0.386	-4.877	100.0
0.3	R_+	cons.	0.6	0.4	0.3	0.3	635	0.786	0.027*	0.950	0.967	0.001	0.009	0.004	0.019	0.004	100.0
0.3	R_+	cons.	0.6	0.4	0.6	0.6	447	0.729	0.000*	0.935	0.000*	0.003	0.009	0.007	-0.006	-0.007	100.0
0.3	R_+	cons.	0.6	0.6	0.0	0.0	698	0.799	0.471	0.947	0.451	-0.001	-0.061	-0.001	-5.979	-2.460	100.0
0.3	R_+	cons.	0.6	0.6	0.3	0.3	635	0.775	0.000*	0.948	0.675	-0.006	-0.061	-0.024	0.098	0.072	100.0
0.3	R_+	cons.	0.6	0.6	0.6	0.6	447	0.727	0.000*	0.942	0.040*	-0.022	-0.061	-0.044	0.083	0.088	100.0
0.3	R_+	sharp	0.4	0.4	0.3	0.3	618	0.774	0.000*	0.945	0.241	0.007	0.078	0.032	-0.096	-0.099	100.0
0.3	R_+	sharp	0.4	0.4	0.6	0.6	416	0.711	0.000*	0.942	0.049*	0.030	0.078	0.058	-0.101	-0.097	100.0
0.3	R_+	sharp	0.4	0.4	0.8	0.8	227	0.689	0.000*	0.946	0.276	0.049	0.077	0.068	-0.109	-0.104	100.0
0.3	R_+	sharp	0.4	0.6	0.3	0.3	618	0.771	0.000*	0.949	0.801	0.002	0.010	0.005	0.028	-0.006	100.0
0.3	R_+	sharp	0.4	0.6	0.6	0.6	416	0.695	0.000*	0.944	0.154	0.003	0.008	0.007	-0.011	-0.011	100.0
0.3	R_+	sharp	0.4	0.6	0.8	0.8	227	0.671	0.000*	0.944	0.111	0.007	0.011	0.009	-0.021	-0.016	100.0
0.3	R_+	sharp	0.6	0.4	0.3	0.3	618	0.763	0.000*	0.947	0.503	0.003	0.011	0.006	-0.008	-0.010	100.0
0.3	R_+	sharp	0.6	0.4	0.6	0.6	416	0.711	0.000*	0.951	0.900	0.006	0.009	0.007	0.004	-0.005	100.0
0.3	R_+	sharp	0.6	0.6	0.3	0.3	618	0.773	0.000*	0.944	0.132	-0.005	-0.059	-0.023	0.059	0.083	100.0
0.3	R_+	sharp	0.6	0.6	0.6	0.6	416	0.713	0.000*	0.950	0.967	-0.022	-0.061	-0.044	0.079	0.078	100.0
0.3	R_-	cons.	0.4	0.4	0.0	0.0	698	0.803	0.650	0.953	0.476	0.001	0.079	0.001	2.023	-3.344	100.0
0.3	R_-	cons.	0.4	0.4	0.3	0.3	635	0.764	0.000*	0.954	0.295	0.008	0.079	0.031	-0.096	-0.097	100.0
0.3	R_-	cons.	0.4	0.4	0.6	0.6	447	0.654	0.000*	0.949	0.737	0.027	0.079	0.057	-0.102	-0.102	100.0
0.3	R_-	cons.	0.4	0.4	0.8	0.8	252	0.578	0.000*	0.943	0.094	0.051	0.079	0.069	-0.099	-0.102	100.0
0.3	R_-	cons.	0.4	0.6	0.0	0.0	698	0.792	0.132	0.949	0.867	-0.001	0.013	0.001	-0.712	4.656	100.0
0.3	R_-	cons.	0.4	0.6	0.3	0.3	635	0.748	0.000*	0.953	0.530	0.002	0.011	0.003	-0.072	-0.007	100.0
0.3	R_-	cons.	0.4	0.6	0.6	0.6	447	0.680	0.000*	0.948	0.615	0.004	0.010	0.007	-0.001	-0.007	100.0
0.3	R_-	cons.	0.4	0.6	0.8	0.8	252	0.604	0.000*	0.945	0.180	0.007	0.010	0.009	-0.003	-0.003	100.0
0.3	R_-	cons.	0.6	0.4	0.0	0.0	698	0.803	0.683	0.950	0.967	0.001	0.014	0.001	1.690	-28.430	100.0
0.3	R_-	cons.	0.6	0.4	0.3	0.3	635	0.746	0.000*	0.946	0.315	0.000	0.010	0.002	-0.006	-0.015	100.0
0.3	R_-	cons.	0.6	0.4	0.6	0.6	447	0.684	0.000*	0.947	0.402	0.004	0.010	0.007	-0.017	-0.013	100.0
0.3	R_-	cons.	0.6	0.6	0.0	0.0	698	0.806	0.787	0.949	0.867	-0.001	-0.059	0.001	5.713	-1.166	100.0
0.3	R_-	cons.	0.6	0.6	0.3	0.3	635	0.760	0.000*	0.948	0.615	-0.006	-0.060	-0.025	0.105	0.086	100.0
0.3	R_-	cons.	0.6	0.6	0.6	0.6	447	0.678	0.000*	0.943	0.086	-0.021	-0.060	-0.044	0.084	0.084	100.0
0.3	R_-	sharp	0.4	0.4	0.3	0.3	618	0.734	0.000*	0.942	0.049*	0.007	0.078	0.031	-0.106	-0.104	100.0
0.3	R_-	sharp	0.4	0.4	0.6	0.6	416	0.642	0.000*	0.942	0.040*	0.028	0.079	0.057	-0.102	-0.103	100.0
0.3	R_-	sharp	0.4	0.4	0.8	0.8	227	0.548	0.000*	0.941	0.026*	0.050	0.080	0.070	-0.099	-0.100	100.0
0.3	R_-	sharp	0.4	0.6	0.3	0.3	618	0.744	0.000*	0.942	0.040*	0.001	0.010	0.004	-0.067	-0.011	100.0
0.3	R_-	sharp	0.4	0.6	0.6	0.6	416	0.650	0.000*	0.952	0.645	0.005	0.010	0.007	0.001	-0.004	100.0
0.3	R_-	sharp	0.4	0.6	0.8	0.8	227	0.579	0.000*	0.942	0.040*	0.009	0.015	0.014	-0.005	-0.007	100.0
0.3	R_-	sharp	0.6	0.4	0.3	0.3	618	0.728	0.000*	0.948	0.615	0.002	0.009	0.003	-0.015	-0.008	100.0
0.3	R_-	sharp	0.6	0.4	0.6	0.6	416	0.616	0.000*	0.948	0.615	0.004	0.010	0.008	-0.009	-0.009	100.0

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Additional simulation results for design I when working assumption A2 is violated: the true within-person correlation structure is AR(1) with correlation ρ

δ	Response	Formula	r_{-1}	r_1	ρ	ρ_{size}	n	$1-\hat{\beta}$	p value	Coverage	p value	$\text{Cor}(R, Y_0^2)$	$\text{Cor}(R, Y_1^2)$	$\text{Cor}(R, Y_0Y_1)$	$\text{Cov}(Y_0, Y_2)$	$\text{Cov}(Y_1, Y_2)$	% Valid
0.3	R_-	sharp	0.6	0.6	0.3	0.3	618	0.741	0.000*	0.948	0.615	-0.006	-0.061	-0.026	0.057	0.081	100.0
0.3	R_-	sharp	0.6	0.6	0.6	0.6	416	0.662	0.000*	0.947	0.402	-0.023	-0.059	-0.045	0.080	0.084	100.0
0.3	$R_{\perp\!\!\perp}$	cons.	0.4	0.4	0.0	0.0	698	0.798	0.399	0.945	0.241	-0.000	-0.001	0.001	0.329	-0.532	100.0
0.3	$R_{\perp\!\!\perp}$	cons.	0.4	0.4	0.3	0.3	635	0.778	0.002*	0.951	0.769	0.002	0.000	-0.000	-0.008	0.007	100.0
0.3	$R_{\perp\!\!\perp}$	cons.	0.4	0.4	0.6	0.6	447	0.688	0.000*	0.942	0.040*	0.001	-0.001	0.000	-0.007	-0.006	100.0
0.3	$R_{\perp\!\!\perp}$	cons.	0.4	0.4	0.8	0.8	252	0.656	0.000*	0.951	0.769	0.002	0.002	0.002	0.002	0.002	100.0
0.3	$R_{\perp\!\!\perp}$	cons.	0.4	0.6	0.0	0.0	698	0.804	0.699	0.952	0.706	-0.001	-0.000	0.002	1.966	-1.472	100.0
0.3	$R_{\perp\!\!\perp}$	cons.	0.4	0.6	0.3	0.3	635	0.769	0.000*	0.949	0.867	0.000	0.001	-0.001	-0.007	0.012	100.0
0.3	$R_{\perp\!\!\perp}$	cons.	0.4	0.6	0.6	0.6	447	0.685	0.000*	0.952	0.645	0.002	-0.002	0.002	-0.002	-0.001	100.0
0.3	$R_{\perp\!\!\perp}$	cons.	0.4	0.6	0.8	0.8	252	0.639	0.000*	0.949	0.867	0.003	0.001	0.002	0.008	0.005	100.0
0.3	$R_{\perp\!\!\perp}$	cons.	0.6	0.4	0.0	0.0	698	0.795	0.253	0.953	0.426	0.001	0.000	-0.002	2.232	-0.917	100.0
0.3	$R_{\perp\!\!\perp}$	cons.	0.6	0.4	0.3	0.3	635	0.770	0.000*	0.946	0.357	-0.000	-0.001	0.001	0.006	0.007	100.0
0.3	$R_{\perp\!\!\perp}$	cons.	0.6	0.4	0.6	0.6	447	0.696	0.000*	0.949	0.801	-0.002	0.002	-0.002	-0.000	0.002	100.0
0.3	$R_{\perp\!\!\perp}$	cons.	0.6	0.4	0.8	0.8	252	0.661	0.000*	0.944	0.154	-0.003	-0.001	-0.002	-0.005	-0.002	100.0
0.3	$R_{\perp\!\!\perp}$	cons.	0.6	0.6	0.0	0.0	698	0.796	0.283	0.942	0.059	0.000	0.001	-0.001	1.919	-1.397	100.0
0.3	$R_{\perp\!\!\perp}$	cons.	0.6	0.6	0.3	0.3	635	0.768	0.000*	0.953	0.476	-0.002	-0.000	0.000	-0.022	-0.001	100.0
0.3	$R_{\perp\!\!\perp}$	cons.	0.6	0.6	0.6	0.6	447	0.710	0.000*	0.946	0.357	-0.001	0.001	-0.000	0.005	0.008	100.0
0.3	$R_{\perp\!\!\perp}$	cons.	0.6	0.6	0.8	0.8	252	0.657	0.000*	0.945	0.241	-0.002	-0.002	-0.002	0.001	0.001	100.0
0.3	$R_{\perp\!\!\perp}$	sharp	0.4	0.4	0.3	0.3	618	0.756	0.000*	0.949	0.737	-0.001	0.001	0.001	-0.006	0.004	100.0
0.3	$R_{\perp\!\!\perp}$	sharp	0.4	0.4	0.6	0.6	416	0.671	0.000*	0.952	0.706	0.002	-0.002	0.002	0.006	0.001	100.0
0.3	$R_{\perp\!\!\perp}$	sharp	0.4	0.4	0.8	0.8	227	0.606	0.000*	0.941	0.033*	-0.001	0.003	-0.001	0.001	0.003	100.0
0.3	$R_{\perp\!\!\perp}$	sharp	0.4	0.6	0.3	0.3	618	0.749	0.000*	0.949	0.801	-0.001	-0.002	-0.002	-0.042	-0.006	100.0
0.3	$R_{\perp\!\!\perp}$	sharp	0.4	0.6	0.6	0.6	416	0.662	0.000*	0.947	0.402	-0.003	-0.002	-0.002	-0.013	-0.004	100.0
0.3	$R_{\perp\!\!\perp}$	sharp	0.4	0.6	0.8	0.8	227	0.606	0.000*	0.939	0.007*	-0.001	-0.002	-0.001	-0.000	-0.001	100.0
0.3	$R_{\perp\!\!\perp}$	sharp	0.6	0.4	0.3	0.3	618	0.764	0.000*	0.943	0.094	0.001	0.002	0.002	0.010	0.004	100.0
0.3	$R_{\perp\!\!\perp}$	sharp	0.6	0.4	0.6	0.6	416	0.666	0.000*	0.947	0.451	0.003	0.002	0.002	0.007	-0.001	100.0
0.3	$R_{\perp\!\!\perp}$	sharp	0.6	0.4	0.8	0.8	227	0.605	0.000*	0.940	0.013*	0.001	0.002	0.001	0.002	0.002	100.0
0.3	$R_{\perp\!\!\perp}$	sharp	0.6	0.6	0.3	0.3	618	0.752	0.000*	0.952	0.706	0.001	-0.001	-0.001	-0.009	-0.003	100.0
0.3	$R_{\perp\!\!\perp}$	sharp	0.6	0.6	0.6	0.6	416	0.685	0.000*	0.942	0.049*	-0.002	0.002	-0.002	-0.002	-0.002	100.0
0.3	$R_{\perp\!\!\perp}$	sharp	0.6	0.6	0.8	0.8	227	0.617	0.000*	0.945	0.209	0.001	-0.003	0.001	-0.001	-0.003	100.0
0.5	R_+	cons.	0.4	0.4	0.0	0.0	252	0.801	0.562	0.942	0.059	-0.001	0.079	-0.003	15.305	0.679	100.0
0.5	R_+	cons.	0.4	0.4	0.3	0.3	229	0.771	0.000*	0.942	0.040*	0.007	0.079	0.032	-0.089	-0.099	100.0
0.5	R_+	cons.	0.4	0.4	0.6	0.6	161	0.742	0.000*	0.935	0.000*	0.031	0.081	0.061	-0.101	-0.101	100.0
0.5	R_+	cons.	0.4	0.4	0.8	0.8	91	0.725	0.000*	0.934	0.000*	0.054	0.081	0.072	-0.112	-0.106	100.0
0.5	R_+	cons.	0.4	0.6	0.0	0.0	252	0.799	0.471	0.941	0.021*	-0.002	0.011	-0.002	12.072	1.704	100.0
0.5	R_+	cons.	0.4	0.6	0.3	0.3	229	0.781	0.006*	0.944	0.111	-0.002	0.011	0.003	-0.043	-0.020	100.0
0.5	R_+	cons.	0.4	0.6	0.6	0.6	161	0.732	0.000*	0.944	0.111	0.008	0.012	0.012	-0.013	-0.006	100.0
0.5	R_+	cons.	0.4	0.6	0.8	0.8	91	0.713	0.000*	0.945	0.180	0.010	0.011	0.012	-0.019	-0.012	100.0
0.5	R_+	cons.	0.6	0.4	0.0	0.0	252	0.795	0.268	0.947	0.402	-0.003	0.010	-0.002	2.184	1.344	100.0
0.5	R_+	cons.	0.6	0.4	0.3	0.3	229	0.796	0.315	0.942	0.059	0.002	0.009	0.003	0.063	-0.010	100.0
0.5	R_+	cons.	0.6	0.4	0.6	0.6	161	0.749	0.000*	0.936	0.001*	0.005	0.010	0.009	0.008	0.002	100.0
0.5	R_+	cons.	0.6	0.6	0.0	0.0	252	0.797	0.348	0.937	0.002*	-0.004	-0.060	-0.002	-0.466	-1.418	100.0
0.5	R_+	cons.	0.6	0.6	0.3	0.3	229	0.771	0.000*	0.953	0.426	-0.009	-0.061	-0.026	0.013	0.053	100.0
0.5	R_+	cons.	0.6	0.6	0.6	0.6	161	0.749	0.000*	0.946	0.276	-0.021	-0.060	-0.041	0.087	0.084	100.0
0.5	R_+	sharp	0.4	0.4	0.3	0.3	223	0.780	0.003*	0.950	0.933	0.007	0.077	0.032	-0.125	-0.108	100.0

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Additional simulation results for design I when working assumption A2 is violated: the true within-person correlation structure is AR(1) with correlation ρ

δ	Response	Formula	r_{-1}	r_1	ρ	ρ_{size}	n	$1-\hat{\beta}$	p value	Coverage	p value	Cor(R, Y_0^2)	Cor(R, Y_1^2)	Cor$(R, Y_0 Y_1)$	Cov(Y_0, Y_2)	Cov(Y_1, Y_2)	% Valid
0.5	R_+	sharp	0.4	0.4	0.6	0.6	150	0.707	0.000*	0.945	0.241	0.030	0.082	0.060	-0.107	-0.103	100.0
0.5	R_+	sharp	0.4	0.4	0.8	0.8	82	0.693	0.000*	0.941	0.026*	0.052	0.082	0.073	-0.118	-0.108	99.9
0.5	R_+	sharp	0.4	0.6	0.3	0.3	223	0.778	0.002*	0.942	0.049*	0.002	0.009	0.004	0.038	-0.013	100.0
0.5	R_+	sharp	0.4	0.6	0.6	0.6	150	0.713	0.000*	0.948	0.557	0.006	0.015	0.012	-0.006	-0.007	100.0
0.5	R_+	sharp	0.4	0.6	0.8	0.8	82	0.670	0.000*	0.940	0.011*	0.008	0.013	0.010	-0.013	-0.000	99.9
0.5	R_+	sharp	0.6	0.4	0.3	0.3	223	0.778	0.002*	0.941	0.033*	0.004	0.008	0.004	-0.016	-0.025	100.0
0.5	R_+	sharp	0.6	0.4	0.6	0.6	150	0.713	0.000*	0.939	0.009*	0.003	0.009	0.007	-0.005	-0.008	100.0
0.5	R_+	sharp	0.6	0.6	0.3	0.3	223	0.770	0.000*	0.948	0.615	-0.004	-0.061	-0.024	0.123	0.084	100.0
0.5	R_+	sharp	0.6	0.6	0.6	0.6	150	0.708	0.000*	0.947	0.402	-0.023	-0.064	-0.045	0.083	0.078	100.0
0.5	R_-	cons.	0.4	0.4	0.0	0.0	252	0.798	0.417	0.955	0.224	0.004	0.079	0.001	5.406	-0.139	100.0
0.5	R_-	cons.	0.4	0.4	0.3	0.3	229	0.763	0.000*	0.942	0.040*	0.009	0.079	0.033	-0.100	-0.103	100.0
0.5	R_-	cons.	0.4	0.4	0.6	0.6	161	0.678	0.000*	0.936	0.001*	0.026	0.078	0.054	-0.116	-0.112	100.0
0.5	R_-	cons.	0.4	0.4	0.8	0.8	91	0.583	0.000*	0.937	0.002*	0.051	0.080	0.070	-0.091	-0.099	100.0
0.5	R_-	cons.	0.4	0.6	0.0	0.0	252	0.799	0.453	0.946	0.315	0.004	0.009	0.001	2.658	2.910	100.0
0.5	R_-	cons.	0.4	0.6	0.3	0.3	229	0.755	0.000*	0.941	0.033*	0.001	0.010	0.006	-0.046	-0.002	100.0
0.5	R_-	cons.	0.4	0.6	0.6	0.6	161	0.674	0.000*	0.946	0.315	0.002	0.011	0.007	-0.028	-0.016	100.0
0.5	R_-	cons.	0.4	0.6	0.8	0.8	91	0.618	0.000*	0.938	0.003*	0.005	0.011	0.007	-0.002	-0.003	99.9
0.5	R_-	cons.	0.6	0.4	0.0	0.0	252	0.800	0.507	0.939	0.006*	0.002	0.010	0.001	-0.376	1.378	100.0
0.5	R_-	cons.	0.6	0.4	0.3	0.3	229	0.754	0.000*	0.938	0.003*	0.001	0.011	0.006	-0.028	-0.016	100.0
0.5	R_-	cons.	0.6	0.4	0.6	0.6	161	0.672	0.000*	0.946	0.276	0.003	0.012	0.007	-0.025	-0.011	100.0
0.5	R_-	cons.	0.6	0.6	0.0	0.0	252	0.810	0.919	0.947	0.402	0.001	-0.062	0.002	1.618	-1.119	100.0
0.5	R_-	cons.	0.6	0.6	0.3	0.3	229	0.770	0.000*	0.942	0.059	-0.006	-0.060	-0.025	0.099	0.078	100.0
0.5	R_-	cons.	0.6	0.6	0.6	0.6	161	0.678	0.000*	0.942	0.059	-0.025	-0.063	-0.049	0.080	0.077	100.0
0.5	R_-	sharp	0.4	0.4	0.3	0.3	223	0.739	0.000*	0.947	0.402	0.007	0.080	0.032	-0.102	-0.101	100.0
0.5	R_-	sharp	0.4	0.4	0.6	0.6	150	0.647	0.000*	0.942	0.040*	0.028	0.081	0.058	-0.107	-0.107	100.0
0.5	R_-	sharp	0.4	0.4	0.8	0.8	82	0.547	0.000*	0.934	0.000*	0.051	0.081	0.070	-0.102	-0.113	99.9
0.5	R_-	sharp	0.4	0.6	0.3	0.3	223	0.759	0.000*	0.944	0.154	0.002	0.011	0.005	0.028	-0.013	100.0
0.5	R_-	sharp	0.4	0.6	0.6	0.6	150	0.651	0.000*	0.942	0.040*	0.003	0.012	0.008	-0.009	-0.011	100.0
0.5	R_-	sharp	0.4	0.6	0.8	0.8	82	0.566	0.000*	0.940	0.011*	0.006	0.010	0.009	0.002	-0.011	99.9
0.5	R_-	sharp	0.6	0.4	0.3	0.3	223	0.747	0.000*	0.946	0.315	0.001	0.013	0.004	-0.045	-0.027	100.0
0.5	R_-	sharp	0.6	0.4	0.6	0.6	150	0.634	0.000*	0.940	0.012*	0.004	0.014	0.008	-0.034	-0.014	100.0
0.5	R_-	sharp	0.6	0.6	0.3	0.3	223	0.765	0.000*	0.947	0.451	-0.005	-0.058	-0.024	0.067	0.085	100.0
0.5	R_-	sharp	0.6	0.6	0.6	0.6	150	0.652	0.000*	0.941	0.026*	-0.024	-0.063	-0.046	0.080	0.086	100.0
0.5	$R_{\perp\perp}$	cons.	0.4	0.4	0.0	0.0	252	0.799	0.453	0.953	0.476	0.002	0.001	-0.003	-7.229	2.731	100.0
0.5	$R_{\perp\perp}$	cons.	0.4	0.4	0.3	0.3	229	0.768	0.000*	0.948	0.557	-0.002	0.003	-0.003	-0.017	0.010	100.0
0.5	$R_{\perp\perp}$	cons.	0.4	0.4	0.6	0.6	161	0.705	0.000*	0.948	0.615	-0.001	0.004	-0.000	-0.003	0.002	100.0
0.5	$R_{\perp\perp}$	cons.	0.4	0.4	0.8	0.8	91	0.643	0.000*	0.945	0.180	-0.003	0.003	-0.001	0.005	0.005	100.0
0.5	$R_{\perp\perp}$	cons.	0.4	0.6	0.0	0.0	252	0.804	0.730	0.944	0.154	0.003	0.002	-0.002	3.037	0.143	100.0
0.5	$R_{\perp\perp}$	cons.	0.4	0.6	0.3	0.3	229	0.768	0.000*	0.945	0.241	0.002	-0.002	0.003	0.029	-0.001	100.0
0.5	$R_{\perp\perp}$	cons.	0.4	0.6	0.6	0.6	161	0.704	0.000*	0.944	0.154	0.004	0.003	0.005	-0.012	-0.009	100.0
0.5	$R_{\perp\perp}$	cons.	0.4	0.6	0.8	0.8	91	0.659	0.000*	0.936	0.001*	-0.006	-0.006	-0.006	-0.000	-0.002	100.0
0.5	$R_{\perp\perp}$	cons.	0.6	0.4	0.0	0.0	252	0.795	0.239	0.937	0.001*	-0.003	-0.002	0.002	-7.906	1.927	100.0
0.5	$R_{\perp\perp}$	cons.	0.6	0.4	0.3	0.3	229	0.770	0.000*	0.941	0.033*	-0.002	0.002	-0.003	-0.034	0.017	100.0
0.5	$R_{\perp\perp}$	cons.	0.6	0.4	0.6	0.6	161	0.710	0.000*	0.944	0.154	-0.004	-0.003	-0.005	-0.012	-0.009	100.0
0.5	$R_{\perp\perp}$	cons.	0.6	0.4	0.8	0.8	91	0.667	0.000*	0.940	0.017*	0.006	0.006	0.006	0.005	0.006	100.0

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Additional simulation results for design I when working assumption A2 is violated: the true within-person correlation structure is AR(1) with correlation ρ

δ	Response	Formula	r_{-1}	r_1	ρ	ρ_{size}	n	$1-\hat{\beta}$	p value	Coverage	p value	$\text{Cor}(R, Y_0^2)$	$\text{Cor}(R, Y_1^2)$	$\text{Cor}(R, Y_0 Y_1)$	$\text{Cov}(Y_0, Y_2)$	$\text{Cov}(Y_1, Y_2)$	% Valid
0.5	$R_{\perp\!\!\!\perp}$	cons.	0.6	0.6	0.0	0.0	252	0.796	0.283	0.941	0.026*	-0.002	-0.001	0.003	110.092	-0.705	100.0
0.5	$R_{\perp\!\!\!\perp}$	cons.	0.6	0.6	0.3	0.3	229	0.774	0.000*	0.949	0.737	0.002	-0.003	0.003	0.094	0.014	100.0
0.5	$R_{\perp\!\!\!\perp}$	cons.	0.6	0.6	0.6	0.6	161	0.707	0.000*	0.951	0.900	0.001	-0.004	0.000	-0.009	-0.007	100.0
0.5	$R_{\perp\!\!\!\perp}$	cons.	0.6	0.6	0.8	0.8	91	0.667	0.000*	0.935	0.000*	0.003	-0.003	0.001	-0.006	-0.009	100.0
0.5	$R_{\perp\!\!\!\perp}$	sharp	0.4	0.4	0.3	0.3	223	0.763	0.000*	0.945	0.241	-0.004	-0.001	-0.002	-0.069	-0.012	100.0
0.5	$R_{\perp\!\!\!\perp}$	sharp	0.4	0.4	0.6	0.6	150	0.656	0.000*	0.938	0.003*	0.001	0.002	0.001	0.004	0.001	100.0
0.5	$R_{\perp\!\!\!\perp}$	sharp	0.4	0.4	0.8	0.8	82	0.619	0.000*	0.938	0.004*	0.002	0.002	0.002	-0.004	-0.002	100.0
0.5	$R_{\perp\!\!\!\perp}$	sharp	0.4	0.6	0.3	0.3	223	0.773	0.000*	0.947	0.503	-0.001	-0.003	0.002	-0.024	-0.016	100.0
0.5	$R_{\perp\!\!\!\perp}$	sharp	0.4	0.6	0.6	0.6	150	0.685	0.000*	0.953	0.476	-0.003	0.002	-0.001	-0.013	0.000	100.0
0.5	$R_{\perp\!\!\!\perp}$	sharp	0.4	0.6	0.8	0.8	82	0.619	0.000*	0.937	0.002*	-0.002	0.003	0.002	0.012	0.014	100.0
0.5	$R_{\perp\!\!\!\perp}$	sharp	0.6	0.4	0.3	0.3	223	0.768	0.000*	0.949	0.801	0.001	0.003	-0.002	-0.049	-0.003	100.0
0.5	$R_{\perp\!\!\!\perp}$	sharp	0.6	0.4	0.6	0.6	150	0.680	0.000*	0.939	0.007*	0.003	-0.002	0.001	0.001	-0.001	100.0
0.5	$R_{\perp\!\!\!\perp}$	sharp	0.6	0.4	0.8	0.8	82	0.617	0.000*	0.932	0.000*	0.002	-0.003	-0.002	-0.013	-0.011	99.9
0.5	$R_{\perp\!\!\!\perp}$	sharp	0.6	0.6	0.3	0.3	223	0.776	0.001*	0.949	0.801	0.004	0.001	0.002	0.008	-0.006	100.0
0.5	$R_{\perp\!\!\!\perp}$	sharp	0.6	0.6	0.6	0.6	150	0.690	0.000*	0.944	0.132	-0.001	-0.002	-0.001	0.006	0.005	100.0
0.5	$R_{\perp\!\!\!\perp}$	sharp	0.6	0.6	0.8	0.8	82	0.616	0.000*	0.932	0.000*	-0.002	-0.002	-0.002	0.008	0.013	100.0

S7.2 Additional Simulations for Design II

Table S9: Additional simulation results for design II when working assumptions A1 and A2 are satisfied

δ	Response	Formula	r_{-1}	r_1	ρ	ρ_{size}	n	$1-\hat{\beta}$	p value	Coverage	p value	$\text{Cor}(R, Y_0^2)$	$\text{Cor}(R, Y_1^2)$	$\text{Cor}(R, Y_0 Y_1)$	$\text{Cov}(Y_0, Y_2)$	$\text{Cov}(Y_1, Y_2)$	% Valid
0.3	R_+	cons.	0.4	0.4	0.0	0.0	559	0.801	0.580	0.955	0.194	-0.001	0.079	0.001	1.057	-0.615	100.0
0.3	R_+	cons.	0.4	0.4	0.3	0.3	508	0.813	0.961	0.950	0.933	0.007	0.078	0.031	-0.031	-0.099	100.0
0.3	R_+	cons.	0.4	0.4	0.6	0.6	358	0.819	0.997	0.947	0.451	0.028	0.078	0.057	-0.045	-0.097	100.0
0.3	R_+	cons.	0.4	0.4	0.8	0.8	201	0.814	0.975	0.952	0.586	0.051	0.079	0.070	-0.074	-0.101	100.0
0.3	R_+	cons.	0.4	0.6	0.0	0.0	524	0.813	0.961	0.945	0.209	0.001	0.010	0.002	-1.033	-6.739	100.0
0.3	R_+	cons.	0.4	0.6	0.3	0.3	477	0.811	0.938	0.950	1.000	-0.001	0.010	0.005	-0.004	-0.007	100.0
0.3	R_+	cons.	0.4	0.6	0.6	0.6	335	0.839	1.000	0.955	0.224	0.003	0.009	0.006	-0.008	-0.013	100.0
0.3	R_+	cons.	0.6	0.4	0.0	0.0	524	0.797	0.331	0.955	0.224	-0.002	0.010	0.001	0.745	2.258	100.0
0.3	R_+	cons.	0.6	0.4	0.3	0.3	477	0.809	0.887	0.949	0.737	0.003	0.012	0.004	-0.001	-0.015	100.0
0.3	R_+	cons.	0.6	0.4	0.6	0.6	335	0.819	0.996	0.949	0.867	0.002	0.009	0.006	-0.006	-0.009	100.0
0.3	R_+	cons.	0.6	0.6	0.0	0.0	489	0.796	0.315	0.951	0.769	0.001	-0.059	0.002	1.300	-3.495	100.0
0.3	R_+	cons.	0.6	0.6	0.3	0.3	445	0.804	0.715	0.936	0.000*	-0.006	-0.061	-0.026	0.016	0.080	100.0
0.3	R_+	cons.	0.6	0.6	0.6	0.6	313	0.831	1.000	0.951	0.834	-0.024	-0.059	-0.045	0.042	0.085	100.0
0.3	R_+	sharp	0.4	0.4	0.3	0.3	498	0.809	0.887	0.951	0.769	0.007	0.081	0.032	-0.021	-0.100	100.0
0.3	R_+	sharp	0.4	0.4	0.6	0.6	339	0.811	0.938	0.951	0.900	0.029	0.082	0.059	-0.046	-0.095	100.0
0.3	R_+	sharp	0.4	0.4	0.8	0.8	187	0.794	0.225	0.944	0.154	0.050	0.079	0.069	-0.076	-0.103	100.0
0.3	R_+	sharp	0.4	0.6	0.3	0.3	468	0.818	0.995	0.949	0.801	0.002	0.012	0.004	0.005	-0.008	100.0
0.3	R_+	sharp	0.4	0.6	0.6	0.6	320	0.802	0.632	0.943	0.071	0.003	0.010	0.006	-0.005	-0.011	100.0
0.3	R_+	sharp	0.6	0.4	0.3	0.3	468	0.807	0.825	0.949	0.737	0.003	0.011	0.002	-0.003	-0.017	100.0
0.3	R_+	sharp	0.6	0.4	0.6	0.6	320	0.796	0.299	0.939	0.006*	0.004	0.010	0.006	-0.006	-0.012	100.0
0.3	R_+	sharp	0.6	0.6	0.3	0.3	438	0.814	0.975	0.948	0.675	-0.006	-0.059	-0.024	0.031	0.078	100.0
0.3	R_+	sharp	0.6	0.6	0.6	0.6	301	0.829	1.000	0.953	0.530	-0.022	-0.060	-0.043	0.043	0.083	100.0
0.3	R_-	cons.	0.4	0.4	0.0	0.0	559	0.808	0.869	0.952	0.586	-0.001	0.078	-0.000	-6.889	-132.627	100.0
0.3	R_-	cons.	0.4	0.4	0.3	0.3	508	0.831	1.000	0.953	0.426	0.007	0.077	0.032	-0.022	-0.090	100.0
0.3	R_-	cons.	0.4	0.4	0.6	0.6	358	0.834	1.000	0.946	0.357	0.027	0.078	0.056	-0.051	-0.100	100.0
0.3	R_-	cons.	0.4	0.4	0.8	0.8	201	0.836	1.000	0.941	0.026*	0.051	0.077	0.069	-0.079	-0.109	100.0
0.3	R_-	cons.	0.4	0.6	0.0	0.0	524	0.799	0.435	0.940	0.017*	0.002	0.009	-0.001	-1.225	-1.641	100.0
0.3	R_-	cons.	0.4	0.6	0.3	0.3	477	0.816	0.987	0.951	0.834	-0.001	0.011	0.004	-0.006	-0.011	100.0
0.3	R_-	cons.	0.4	0.6	0.6	0.6	335	0.840	1.000	0.952	0.706	0.006	0.010	0.008	0.002	-0.005	100.0
0.3	R_-	cons.	0.6	0.4	0.0	0.0	524	0.796	0.283	0.945	0.209	-0.001	0.010	-0.002	0.111	1.097	100.0
0.3	R_-	cons.	0.6	0.4	0.3	0.3	477	0.818	0.995	0.942	0.049*	0.003	0.011	0.005	-0.001	-0.001	100.0
0.3	R_-	cons.	0.6	0.4	0.6	0.6	335	0.840	1.000	0.947	0.503	0.004	0.011	0.007	0.005	-0.004	100.0
0.3	R_-	cons.	0.6	0.6	0.0	0.0	489	0.793	0.175	0.950	0.933	0.001	-0.061	-0.002	-1.186	0.992	100.0
0.3	R_-	cons.	0.6	0.6	0.3	0.3	445	0.818	0.993	0.949	0.737	-0.008	-0.060	-0.024	0.020	0.087	100.0
0.3	R_-	cons.	0.6	0.6	0.6	0.6	313	0.844	1.000	0.943	0.086	-0.022	-0.063	-0.046	0.041	0.071	100.0
0.3	R_-	sharp	0.4	0.4	0.3	0.3	498	0.813	0.965	0.950	0.933	0.008	0.076	0.032	-0.023	-0.094	100.0
0.3	R_-	sharp	0.4	0.4	0.6	0.6	339	0.801	0.562	0.947	0.451	0.027	0.077	0.055	-0.058	-0.106	100.0
0.3	R_-	sharp	0.4	0.4	0.8	0.8	187	0.816	0.987	0.940	0.012*	0.049	0.077	0.068	-0.071	-0.098	100.0
0.3	R_-	sharp	0.4	0.6	0.3	0.3	468	0.809	0.896	0.944	0.132	0.002	0.010	0.006	-0.003	-0.001	100.0
0.3	R_-	sharp	0.4	0.6	0.6	0.6	320	0.806	0.800	0.949	0.801	0.004	0.010	0.007	-0.001	0.001	100.0
0.3	R_-	sharp	0.6	0.4	0.3	0.3	468	0.812	0.953	0.946	0.315	0.003	0.010	0.007	-0.003	-0.005	100.0
0.3	R_-	sharp	0.6	0.4	0.6	0.6	320	0.815	0.980	0.940	0.013*	0.004	0.011	0.007	-0.004	-0.006	100.0
0.3	R_-	sharp	0.6	0.6	0.3	0.3	438	0.803	0.666	0.946	0.276	-0.005	-0.059	-0.024	0.022	0.080	100.0
0.3	R_-	sharp	0.6	0.6	0.6	0.6	301	0.831	1.000	0.944	0.132	-0.024	-0.063	-0.046	0.040	0.080	100.0

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Additional simulation results for design II when working assumptions A1 and A2 are satisfied

δ	Response	Formula	r_{-1}	r_1	ρ	ρ_{size}	n	$1-\hat{\beta}$	p value	Coverage	p value	$\text{Cor}(R, Y_0^2)$	$\text{Cor}(R, Y_1^2)$	$\text{Cor}(R, Y_0Y_1)$	$\text{Cov}(Y_0, Y_2)$	$\text{Cov}(Y_1, Y_2)$	% Valid
0.3	$R_{\perp\!\!\!\perp}$	cons.	0.4	0.4	0.0	0.0	559	0.801	0.562	0.941	0.021*	-0.002	0.000	-0.002	5.995	-2.940	100.0
0.3	$R_{\perp\!\!\!\perp}$	cons.	0.4	0.4	0.3	0.3	508	0.804	0.715	0.951	0.769	0.000	-0.002	-0.001	-0.010	-0.007	100.0
0.3	$R_{\perp\!\!\!\perp}$	cons.	0.4	0.4	0.6	0.6	358	0.817	0.992	0.946	0.357	0.003	0.002	0.002	0.006	0.004	100.0
0.3	$R_{\perp\!\!\!\perp}$	cons.	0.4	0.4	0.8	0.8	201	0.836	1.000	0.948	0.557	-0.002	-0.002	-0.002	-0.000	0.000	100.0
0.3	$R_{\perp\!\!\!\perp}$	cons.	0.4	0.6	0.0	0.0	524	0.806	0.787	0.943	0.071	0.002	-0.001	0.000	-9.908	-3.397	100.0
0.3	$R_{\perp\!\!\!\perp}$	cons.	0.4	0.6	0.3	0.3	477	0.807	0.825	0.948	0.615	0.000	-0.003	-0.001	-0.001	-0.004	100.0
0.3	$R_{\perp\!\!\!\perp}$	cons.	0.4	0.6	0.6	0.6	335	0.833	1.000	0.960	0.015*	-0.001	-0.001	-0.000	-0.001	-0.003	100.0
0.3	$R_{\perp\!\!\!\perp}$	cons.	0.4	0.6	0.8	0.8	189	0.840	1.000	0.949	0.801	0.002	0.001	0.001	0.001	-0.002	100.0
0.3	$R_{\perp\!\!\!\perp}$	cons.	0.6	0.4	0.0	0.0	524	0.794	0.212	0.957	0.079	-0.002	0.001	-0.000	3.552	-0.370	100.0
0.3	$R_{\perp\!\!\!\perp}$	cons.	0.6	0.4	0.3	0.3	477	0.805	0.774	0.948	0.615	-0.000	0.003	0.001	-0.005	-0.002	100.0
0.3	$R_{\perp\!\!\!\perp}$	cons.	0.6	0.4	0.6	0.6	335	0.817	0.991	0.953	0.426	0.001	0.001	0.000	0.005	0.004	100.0
0.3	$R_{\perp\!\!\!\perp}$	cons.	0.6	0.4	0.8	0.8	189	0.836	1.000	0.939	0.007*	-0.002	-0.001	-0.001	0.000	0.001	100.0
0.3	$R_{\perp\!\!\!\perp}$	cons.	0.6	0.6	0.0	0.0	489	0.804	0.715	0.952	0.645	0.002	0.002	-0.002	-0.609	-1.578	100.0
0.3	$R_{\perp\!\!\!\perp}$	cons.	0.6	0.6	0.3	0.3	445	0.797	0.365	0.937	0.002*	0.001	-0.001	0.002	0.002	0.003	100.0
0.3	$R_{\perp\!\!\!\perp}$	cons.	0.6	0.6	0.6	0.6	313	0.824	1.000	0.944	0.154	0.001	0.003	0.002	-0.001	0.002	100.0
0.3	$R_{\perp\!\!\!\perp}$	cons.	0.6	0.6	0.8	0.8	176	0.845	1.000	0.944	0.132	0.002	-0.001	0.001	-0.000	-0.002	100.0
0.3	$R_{\perp\!\!\!\perp}$	sharp	0.4	0.4	0.3	0.3	498	0.803	0.666	0.949	0.867	-0.001	0.002	-0.001	-0.001	-0.006	100.0
0.3	$R_{\perp\!\!\!\perp}$	sharp	0.4	0.4	0.6	0.6	339	0.805	0.745	0.946	0.357	-0.002	-0.003	-0.002	0.000	-0.006	100.0
0.3	$R_{\perp\!\!\!\perp}$	sharp	0.4	0.4	0.8	0.8	187	0.812	0.957	0.951	0.900	-0.003	-0.001	-0.001	-0.001	0.001	100.0
0.3	$R_{\perp\!\!\!\perp}$	sharp	0.4	0.6	0.3	0.3	468	0.813	0.969	0.945	0.180	-0.000	-0.001	-0.002	-0.011	0.000	100.0
0.3	$R_{\perp\!\!\!\perp}$	sharp	0.4	0.6	0.6	0.6	320	0.802	0.597	0.949	0.867	-0.003	-0.001	-0.001	-0.001	-0.005	100.0
0.3	$R_{\perp\!\!\!\perp}$	sharp	0.4	0.6	0.8	0.8	176	0.816	0.989	0.947	0.451	-0.001	-0.002	-0.002	0.002	-0.000	100.0
0.3	$R_{\perp\!\!\!\perp}$	sharp	0.6	0.4	0.3	0.3	468	0.801	0.580	0.944	0.132	0.000	0.001	0.002	0.001	-0.002	100.0
0.3	$R_{\perp\!\!\!\perp}$	sharp	0.6	0.4	0.6	0.6	320	0.793	0.186	0.948	0.557	0.003	0.001	0.001	0.003	0.004	100.0
0.3	$R_{\perp\!\!\!\perp}$	sharp	0.6	0.4	0.8	0.8	176	0.804	0.715	0.944	0.154	0.001	0.002	0.002	-0.002	-0.000	100.0
0.3	$R_{\perp\!\!\!\perp}$	sharp	0.6	0.6	0.3	0.3	438	0.803	0.666	0.949	0.867	0.001	0.002	-0.002	0.002	-0.004	100.0
0.3	$R_{\perp\!\!\!\perp}$	sharp	0.6	0.6	0.6	0.6	301	0.800	0.507	0.943	0.086	0.002	0.002	0.002	0.004	0.007	100.0
0.3	$R_{\perp\!\!\!\perp}$	sharp	0.6	0.6	0.8	0.8	166	0.819	0.996	0.949	0.737	0.002	0.002	0.002	-0.000	0.001	100.0
0.5	R_+	cons.	0.4	0.4	0.0	0.0	201	0.800	0.525	0.942	0.059	-0.002	0.079	0.001	-0.312	-0.007	100.0
0.5	R_+	cons.	0.4	0.4	0.3	0.3	183	0.800	0.525	0.942	0.059	0.009	0.077	0.033	-0.020	-0.082	100.0
0.5	R_+	cons.	0.4	0.4	0.6	0.6	129	0.828	1.000	0.943	0.071	0.028	0.082	0.058	-0.059	-0.095	100.0
0.5	R_+	cons.	0.4	0.4	0.8	0.8	73	0.841	1.000	0.928	0.000*	0.050	0.077	0.068	-0.080	-0.112	100.0
0.5	R_+	cons.	0.4	0.6	0.0	0.0	189	0.802	0.597	0.936	0.000*	0.002	0.009	-0.003	-0.029	-1.744	100.0
0.5	R_+	cons.	0.4	0.6	0.3	0.3	172	0.809	0.887	0.943	0.086	0.001	0.013	0.004	0.001	-0.027	100.0
0.5	R_+	cons.	0.4	0.6	0.6	0.6	121	0.831	1.000	0.940	0.017*	0.004	0.010	0.007	-0.004	-0.013	100.0
0.5	R_+	cons.	0.6	0.4	0.0	0.0	189	0.800	0.489	0.946	0.276	-0.002	0.010	-0.002	-1.141	1.114	100.0
0.5	R_+	cons.	0.6	0.4	0.3	0.3	172	0.812	0.953	0.946	0.315	0.002	0.014	0.006	0.000	0.012	100.0
0.5	R_+	cons.	0.6	0.4	0.6	0.6	121	0.825	1.000	0.939	0.006*	0.004	0.008	0.007	0.004	-0.011	100.0
0.5	R_+	cons.	0.6	0.6	0.0	0.0	176	0.799	0.453	0.946	0.357	-0.003	-0.060	-0.003	-1.694	-1.570	100.0
0.5	R_+	cons.	0.6	0.6	0.3	0.3	160	0.815	0.980	0.945	0.209	-0.005	-0.061	-0.024	0.016	0.085	100.0
0.5	R_+	cons.	0.6	0.6	0.6	0.6	113	0.830	1.000	0.943	0.086	-0.027	-0.070	-0.051	0.032	0.065	100.0
0.5	R_+	sharp	0.4	0.4	0.3	0.3	180	0.801	0.562	0.941	0.033*	0.010	0.082	0.033	-0.044	-0.108	100.0
0.5	R_+	sharp	0.4	0.4	0.6	0.6	122	0.804	0.715	0.940	0.013*	0.032	0.080	0.058	-0.053	-0.103	100.0
0.5	R_+	sharp	0.4	0.4	0.8	0.8	67	0.788	0.058	0.932	0.000*	0.053	0.083	0.072	-0.062	-0.096	100.0
0.5	R_+	sharp	0.4	0.6	0.3	0.3	169	0.813	0.961	0.939	0.009*	0.007	0.008	0.003	-0.002	0.008	100.0
0.5	R_+	sharp	0.4	0.6	0.6	0.6	115	0.828	1.000	0.937	0.002*	0.006	0.012	0.008	-0.003	-0.014	100.0
0.5	R_+	sharp	0.6	0.4	0.3	0.3	169	0.813	0.961	0.937	0.001*	0.002	0.010	0.005	0.017	0.007	100.0

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Additional simulation results for design II when working assumptions A1 and A2 are satisfied

δ	Response	Formula	r_{-1}	r_1	ρ	ρ_{size}	n	$1-\hat{\beta}$	p value	Coverage	p value	Cor(R, Y_0^2)	Cor(R, Y_1^2)	Cor$(R, Y_0 Y_1)$	Cov(Y_0, Y_2)	Cov(Y_1, Y_2)	% Valid
0.5	R_+	sharp	0.6	0.4	0.6	0.6	115	0.809	0.904	0.938	0.004*	0.006	0.009	0.007	-0.006	-0.010	100.0
0.5	R_+	sharp	0.6	0.6	0.3	0.3	158	0.806	0.787	0.945	0.241	-0.005	-0.059	-0.023	0.037	0.096	100.0
0.5	R_+	sharp	0.6	0.6	0.6	0.6	109	0.823	0.999	0.932	0.000*	-0.025	-0.060	-0.046	0.042	0.082	100.0
0.5	R_-	cons.	0.4	0.4	0.0	0.0	201	0.802	0.632	0.950	0.967	0.002	0.078	-0.001	-6.314	-0.973	100.0
0.5	R_-	cons.	0.4	0.4	0.3	0.3	183	0.819	0.995	0.939	0.006*	0.007	0.077	0.031	-0.034	-0.114	100.0
0.5	R_-	cons.	0.4	0.4	0.6	0.6	129	0.833	1.000	0.938	0.003*	0.028	0.078	0.058	-0.049	-0.103	100.0
0.5	R_-	cons.	0.4	0.4	0.8	0.8	73	0.852	1.000	0.939	0.006*	0.052	0.084	0.075	-0.088	-0.112	100.0
0.5	R_-	cons.	0.4	0.6	0.0	0.0	189	0.808	0.878	0.938	0.004*	0.003	0.011	0.002	-3.081	-1.483	100.0
0.5	R_-	cons.	0.4	0.6	0.3	0.3	172	0.830	1.000	0.945	0.209	-0.001	0.010	0.005	-0.002	-0.014	100.0
0.5	R_-	cons.	0.4	0.6	0.6	0.6	121	0.828	1.000	0.934	0.000*	0.005	0.011	0.008	-0.002	-0.013	100.0
0.5	R_-	cons.	0.6	0.4	0.0	0.0	189	0.810	0.919	0.943	0.086	-0.003	0.011	0.004	0.923	-1.917	100.0
0.5	R_-	cons.	0.6	0.4	0.3	0.3	172	0.827	1.000	0.947	0.402	0.002	0.013	0.004	-0.018	-0.001	100.0
0.5	R_-	cons.	0.6	0.4	0.6	0.6	121	0.847	1.000	0.938	0.003*	0.007	0.012	0.009	0.001	-0.002	100.0
0.5	R_-	cons.	0.6	0.6	0.0	0.0	176	0.796	0.283	0.943	0.086	-0.005	-0.061	-0.003	-0.924	-12.598	100.0
0.5	R_-	cons.	0.6	0.6	0.3	0.3	160	0.821	0.998	0.941	0.033*	-0.006	-0.060	-0.025	0.025	0.090	100.0
0.5	R_-	cons.	0.6	0.6	0.6	0.6	113	0.837	1.000	0.943	0.086	-0.022	-0.060	-0.043	0.047	0.098	100.0
0.5	R_-	sharp	0.4	0.4	0.3	0.3	180	0.800	0.525	0.940	0.013*	0.006	0.080	0.035	-0.017	-0.091	100.0
0.5	R_-	sharp	0.4	0.4	0.6	0.6	122	0.811	0.938	0.941	0.026*	0.027	0.078	0.057	-0.058	-0.100	100.0
0.5	R_-	sharp	0.4	0.4	0.8	0.8	67	0.802	0.615	0.929	0.000*	0.053	0.084	0.073	-0.087	-0.108	100.0
0.5	R_-	sharp	0.4	0.6	0.3	0.3	169	0.808	0.878	0.939	0.007*	0.003	0.009	0.003	0.001	0.016	100.0
0.5	R_-	sharp	0.4	0.6	0.6	0.6	115	0.812	0.953	0.936	0.000*	0.006	0.011	0.008	0.001	-0.006	100.0
0.5	R_-	sharp	0.6	0.4	0.3	0.3	169	0.806	0.800	0.935	0.000*	-0.005	0.012	0.004	-0.008	-0.023	100.0
0.5	R_-	sharp	0.6	0.4	0.6	0.6	115	0.824	1.000	0.941	0.033*	0.007	0.014	0.010	-0.016	-0.017	100.0
0.5	R_-	sharp	0.6	0.6	0.3	0.3	158	0.818	0.995	0.944	0.132	-0.008	-0.062	-0.026	0.009	0.060	100.0
0.5	R_-	sharp	0.6	0.6	0.6	0.6	109	0.841	1.000	0.941	0.021*	-0.019	-0.059	-0.041	0.051	0.082	100.0
0.5	$R_{\perp\!\!\!\perp}$	cons.	0.4	0.4	0.0	0.0	201	0.801	0.580	0.951	0.834	-0.002	-0.001	0.001	3.545	0.583	100.0
0.5	$R_{\perp\!\!\!\perp}$	cons.	0.4	0.4	0.3	0.3	183	0.813	0.969	0.944	0.111	0.002	-0.000	0.003	0.010	-0.008	100.0
0.5	$R_{\perp\!\!\!\perp}$	cons.	0.4	0.4	0.6	0.6	129	0.814	0.972	0.938	0.004*	-0.001	0.004	0.001	0.011	0.010	100.0
0.5	$R_{\perp\!\!\!\perp}$	cons.	0.4	0.4	0.8	0.8	73	0.839	1.000	0.941	0.026*	0.002	0.005	0.005	0.002	-0.001	100.0
0.5	$R_{\perp\!\!\!\perp}$	cons.	0.4	0.6	0.0	0.0	189	0.816	0.987	0.946	0.357	0.002	0.004	-0.001	-4.920	-1.927	100.0
0.5	$R_{\perp\!\!\!\perp}$	cons.	0.4	0.6	0.3	0.3	172	0.814	0.975	0.943	0.071	-0.003	0.005	0.002	-0.006	0.020	100.0
0.5	$R_{\perp\!\!\!\perp}$	cons.	0.4	0.6	0.6	0.6	121	0.815	0.984	0.946	0.276	0.002	0.003	0.002	-0.000	0.002	100.0
0.5	$R_{\perp\!\!\!\perp}$	cons.	0.4	0.6	0.8	0.8	68	0.838	1.000	0.935	0.000*	-0.004	-0.001	-0.002	0.003	0.008	100.0
0.5	$R_{\perp\!\!\!\perp}$	cons.	0.6	0.4	0.0	0.0	189	0.800	0.507	0.946	0.357	-0.002	-0.004	0.001	1.571	-3.074	100.0
0.5	$R_{\perp\!\!\!\perp}$	cons.	0.6	0.4	0.3	0.3	172	0.813	0.965	0.950	0.933	0.003	-0.005	-0.002	-0.001	-0.010	100.0
0.5	$R_{\perp\!\!\!\perp}$	cons.	0.6	0.4	0.6	0.6	121	0.824	1.000	0.947	0.451	-0.002	-0.003	-0.002	-0.010	-0.005	100.0
0.5	$R_{\perp\!\!\!\perp}$	cons.	0.6	0.4	0.8	0.8	68	0.835	1.000	0.932	0.000*	0.004	0.001	0.002	0.025	0.020	99.8
0.5	$R_{\perp\!\!\!\perp}$	cons.	0.6	0.6	0.0	0.0	176	0.807	0.837	0.947	0.503	0.002	-0.002	-0.002	-2.984	12.882	100.0
0.5	$R_{\perp\!\!\!\perp}$	cons.	0.6	0.6	0.3	0.3	160	0.816	0.989	0.947	0.402	0.004	-0.002	0.003	0.014	0.012	100.0
0.5	$R_{\perp\!\!\!\perp}$	cons.	0.6	0.6	0.6	0.6	113	0.829	1.000	0.929	0.000*	0.001	0.001	-0.000	0.001	-0.002	100.0
0.5	$R_{\perp\!\!\!\perp}$	cons.	0.6	0.6	0.8	0.8	64	0.845	1.000	0.928	0.000*	-0.002	-0.006	-0.004	0.031	0.029	99.5
0.5	$R_{\perp\!\!\!\perp}$	sharp	0.4	0.4	0.3	0.3	180	0.800	0.507	0.935	0.000*	-0.001	-0.003	-0.003	-0.001	-0.023	100.0
0.5	$R_{\perp\!\!\!\perp}$	sharp	0.4	0.4	0.6	0.6	122	0.807	0.848	0.947	0.451	-0.002	0.004	-0.003	0.000	-0.003	100.0
0.5	$R_{\perp\!\!\!\perp}$	sharp	0.4	0.4	0.8	0.8	67	0.816	0.986	0.933	0.000*	0.001	0.003	0.003	0.009	0.013	100.0
0.5	$R_{\perp\!\!\!\perp}$	sharp	0.4	0.6	0.3	0.3	169	0.789	0.076	0.942	0.040*	0.005	-0.003	-0.002	-0.009	-0.011	100.0
0.5	$R_{\perp\!\!\!\perp}$	sharp	0.4	0.6	0.6	0.6	115	0.818	0.995	0.945	0.241	0.004	-0.001	0.004	-0.001	0.004	100.0
0.5	$R_{\perp\!\!\!\perp}$	sharp	0.4	0.6	0.8	0.8	64	0.824	1.000	0.938	0.004*	-0.001	0.004	0.003	0.010	0.009	99.7

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Additional simulation results for design II when working assumptions A1 and A2 are satisfied

δ	Response	Formula	r_{-1}	r_1	ρ	ρ_{size}	n	$1-\hat{\beta}$	p value	Coverage	p value	Cor(R, Y_0^2)	Cor(R, Y_1^2)	Cor$(R, Y_0 Y_1)$	Cov(Y_0, Y_2)	Cov(Y_1, Y_2)	% Valid
0.5	$R_{\perp\!\!\!\perp}$	sharp	0.6	0.4	0.3	0.3	169	0.789	0.064	0.939	0.006*	-0.005	0.003	0.002	0.001	0.009	100.0
0.5	$R_{\perp\!\!\!\perp}$	sharp	0.6	0.4	0.6	0.6	115	0.806	0.787	0.937	0.002*	-0.004	0.001	-0.004	-0.008	-0.008	100.0
0.5	$R_{\perp\!\!\!\perp}$	sharp	0.6	0.4	0.8	0.8	64	0.817	0.992	0.932	0.000*	0.001	-0.004	-0.002	0.008	0.008	99.9
0.5	$R_{\perp\!\!\!\perp}$	sharp	0.6	0.6	0.3	0.3	158	0.808	0.858	0.934	0.000*	-0.000	-0.001	0.002	-0.001	-0.003	100.0
0.5	$R_{\perp\!\!\!\perp}$	sharp	0.6	0.6	0.6	0.6	109	0.806	0.800	0.939	0.009*	0.001	0.007	0.005	0.007	0.015	100.0
0.5	$R_{\perp\!\!\!\perp}$	sharp	0.6	0.6	0.8	0.8	60	0.831	1.000	0.936	0.001*	0.003	0.003	0.002	0.048	0.050	99.3

Table S10: Additional simulation results for design II when working assumption A1(a) is violated: responders' end-of-study variance is 25% below the appropriate lower bound.

δ	Response	Formula	r_{-1}	r_1	ρ	ρ_{size}	n	$1-\hat{\beta}$	p value	Coverage	p value	$\text{Cor}(R, Y_0^2)$	$\text{Cor}(R, Y_1^2)$	$\text{Cor}(R, Y_0 Y_1)$	$\text{Cov}(Y_0, Y_2)$	$\text{Cov}(Y_1, Y_2)$	% Valid
0.3	R_+	cons.	0.4	0.4	0.0	0.0	559	0.778	0.001*	0.950	0.933	-0.001	0.078	-0.000	-4.456	-70.580	100.0
0.3	R_+	cons.	0.4	0.4	0.3	0.3	508	0.800	0.507	0.950	0.967	0.007	0.077	0.032	-0.022	-0.090	100.0
0.3	R_+	cons.	0.4	0.4	0.6	0.6	358	0.807	0.848	0.942	0.059	0.027	0.078	0.056	-0.051	-0.100	100.0
0.3	R_+	cons.	0.4	0.4	0.8	0.8	201	0.809	0.904	0.946	0.276	0.051	0.077	0.069	-0.079	-0.109	100.0
0.3	R_+	cons.	0.4	0.6	0.0	0.0	524	0.743	0.000*	0.944	0.111	0.002	0.009	-0.001	-1.140	-1.411	100.0
0.3	R_+	cons.	0.4	0.6	0.3	0.3	477	0.767	0.000*	0.952	0.645	-0.001	0.011	0.004	-0.006	-0.010	100.0
0.3	R_+	cons.	0.4	0.6	0.6	0.6	335	0.802	0.597	0.950	0.967	0.006	0.010	0.008	0.002	-0.005	100.0
0.3	R_+	cons.	0.4	0.6	0.8	0.8	189	0.780	0.003*	0.945	0.209	0.007	0.009	0.009	-0.002	-0.007	100.0
0.3	R_+	cons.	0.6	0.4	0.0	0.0	524	0.745	0.000*	0.944	0.154	-0.001	0.010	-0.002	-0.256	1.061	100.0
0.3	R_+	cons.	0.6	0.4	0.3	0.3	477	0.768	0.000*	0.939	0.009*	0.003	0.011	0.005	-0.001	-0.001	100.0
0.3	R_+	cons.	0.6	0.4	0.6	0.6	335	0.802	0.632	0.948	0.557	0.004	0.011	0.007	0.005	-0.003	100.0
0.3	R_+	cons.	0.6	0.4	0.8	0.8	189	0.804	0.699	0.941	0.033*	0.008	0.011	0.011	-0.013	-0.017	100.0
0.3	R_+	cons.	0.6	0.6	0.0	0.0	489	0.736	0.000*	0.950	0.967	0.001	-0.061	-0.002	-1.115	0.989	100.0
0.3	R_+	cons.	0.6	0.6	0.3	0.3	445	0.758	0.000*	0.946	0.276	-0.008	-0.060	-0.024	0.017	0.084	100.0
0.3	R_+	cons.	0.6	0.6	0.6	0.6	313	0.793	0.163	0.945	0.180	-0.022	-0.063	-0.046	0.042	0.072	100.0
0.3	R_+	cons.	0.6	0.6	0.8	0.8	176	0.754	0.000*	0.942	0.040*	-0.039	-0.061	-0.054	0.063	0.079	100.0
0.3	R_+	sharp	0.4	0.4	0.3	0.3	498	0.777	0.001*	0.950	0.933	0.008	0.076	0.032	-0.025	-0.095	100.0
0.3	R_+	sharp	0.4	0.4	0.6	0.6	339	0.781	0.005*	0.949	0.737	0.027	0.077	0.055	-0.058	-0.106	100.0
0.3	R_+	sharp	0.4	0.4	0.8	0.8	187	0.787	0.040*	0.935	0.000*	0.049	0.077	0.068	-0.071	-0.098	100.0
0.3	R_+	sharp	0.4	0.6	0.3	0.3	468	0.771	0.000*	0.946	0.276	0.002	0.010	0.006	-0.003	-0.002	100.0
0.3	R_+	sharp	0.4	0.6	0.6	0.6	320	0.767	0.000*	0.951	0.769	0.004	0.010	0.007	0.000	0.001	100.0
0.3	R_+	sharp	0.4	0.6	0.8	0.8	176	0.755	0.000*	0.945	0.180	0.008	0.008	0.008	-0.010	-0.015	100.0
0.3	R_+	sharp	0.6	0.4	0.3	0.3	468	0.772	0.000*	0.945	0.241	0.003	0.010	0.007	-0.003	-0.007	100.0
0.3	R_+	sharp	0.6	0.4	0.6	0.6	320	0.780	0.004*	0.939	0.006*	0.004	0.011	0.007	-0.005	-0.006	100.0
0.3	R_+	sharp	0.6	0.4	0.8	0.8	176	0.777	0.001*	0.948	0.675	0.007	0.009	0.008	-0.010	-0.014	100.0
0.3	R_+	sharp	0.6	0.6	0.3	0.3	438	0.748	0.000*	0.941	0.026*	-0.005	-0.059	-0.024	0.020	0.080	100.0
0.3	R_+	sharp	0.6	0.6	0.6	0.6	301	0.773	0.000*	0.939	0.006*	-0.024	-0.063	-0.046	0.039	0.078	100.0
0.3	R_+	sharp	0.6	0.6	0.8	0.8	166	0.737	0.000*	0.948	0.675	-0.037	-0.060	-0.052	0.058	0.078	100.0
0.3	R_-	cons.	0.4	0.4	0.0	0.0	559	0.778	0.001*	0.950	0.933	-0.001	0.078	-0.000	-4.456	-70.580	100.0
0.3	R_-	cons.	0.4	0.4	0.3	0.3	508	0.799	0.453	0.951	0.900	0.007	0.077	0.032	-0.022	-0.090	100.0
0.3	R_-	cons.	0.4	0.4	0.6	0.6	358	0.802	0.632	0.943	0.086	0.027	0.078	0.056	-0.050	-0.100	100.0
0.3	R_-	cons.	0.4	0.4	0.8	0.8	201	0.802	0.615	0.947	0.402	0.051	0.077	0.069	-0.078	-0.108	100.0
0.3	R_-	cons.	0.4	0.6	0.0	0.0	524	0.743	0.000*	0.944	0.111	0.002	0.009	-0.001	-1.140	-1.411	100.0
0.3	R_-	cons.	0.4	0.6	0.3	0.3	477	0.767	0.000*	0.953	0.476	-0.001	0.011	0.004	-0.006	-0.010	100.0
0.3	R_-	cons.	0.4	0.6	0.6	0.6	335	0.804	0.699	0.951	0.834	0.006	0.010	0.008	0.002	-0.005	100.0
0.3	R_-	cons.	0.4	0.6	0.8	0.8	189	0.799	0.435	0.944	0.154	0.007	0.009	0.009	-0.003	-0.008	100.0
0.3	R_-	cons.	0.6	0.4	0.0	0.0	524	0.745	0.000*	0.944	0.154	-0.001	0.010	-0.002	-0.256	1.061	100.0
0.3	R_-	cons.	0.6	0.4	0.3	0.3	477	0.763	0.000*	0.941	0.021*	0.003	0.011	0.005	-0.001	-0.000	100.0
0.3	R_-	cons.	0.6	0.4	0.6	0.6	335	0.785	0.024*	0.945	0.209	0.004	0.011	0.007	0.005	-0.003	100.0
0.3	R_-	cons.	0.6	0.6	0.0	0.0	489	0.736	0.000*	0.950	0.967	0.001	-0.061	-0.002	-1.115	0.989	100.0
0.3	R_-	cons.	0.6	0.6	0.3	0.3	445	0.759	0.000*	0.945	0.180	-0.008	-0.060	-0.024	0.017	0.085	100.0
0.3	R_-	cons.	0.6	0.6	0.6	0.6	313	0.777	0.001*	0.945	0.209	-0.022	-0.063	-0.046	0.042	0.071	100.0
0.3	R_-	sharp	0.4	0.4	0.3	0.3	498	0.776	0.001*	0.950	1.000	0.008	0.076	0.032	-0.024	-0.095	100.0
0.3	R_-	sharp	0.4	0.4	0.6	0.6	339	0.777	0.001*	0.949	0.867	0.027	0.077	0.055	-0.058	-0.106	100.0
0.3	R_-	sharp	0.4	0.4	0.8	0.8	187	0.770	0.000*	0.938	0.004*	0.049	0.077	0.068	-0.071	-0.099	100.0
0.3	R_-	sharp	0.4	0.6	0.3	0.3	468	0.770	0.000*	0.947	0.451	0.002	0.010	0.006	-0.003	-0.002	100.0

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Additional simulation results for design II when working assumption A1(a) is violated: responders' end-of-study variance is 25% below the appropriate lower bound.

δ	Response	Formula	r_{-1}	r_1	ρ	ρ_{size}	n	$1-\hat{\beta}$	p value	Coverage	p value	$\text{Cor}(R, Y_0^2)$	$\text{Cor}(R, Y_1^2)$	$\text{Cor}(R, Y_0 Y_1)$	$\text{Cov}(Y_0, Y_2)$	$\text{Cov}(Y_1, Y_2)$	% Valid
0.3	R_-	sharp	0.4	0.6	0.6	0.6	320	0.769	0.000*	0.950	1.000	0.004	0.010	0.007	0.000	0.002	100.0
0.3	R_-	sharp	0.4	0.6	0.8	0.8	176	0.774	0.000*	0.947	0.503	0.008	0.008	0.008	-0.009	-0.015	100.0
0.3	R_-	sharp	0.6	0.4	0.3	0.3	468	0.767	0.000*	0.946	0.276	0.003	0.010	0.007	-0.003	-0.007	100.0
0.3	R_-	sharp	0.6	0.4	0.6	0.6	320	0.757	0.000*	0.940	0.017*	0.004	0.011	0.007	-0.004	-0.005	100.0
0.3	R_-	sharp	0.6	0.6	0.3	0.3	438	0.746	0.000*	0.941	0.033*	-0.005	-0.059	-0.024	0.020	0.080	100.0
0.3	R_-	sharp	0.6	0.6	0.6	0.6	301	0.763	0.000*	0.940	0.012*	-0.024	-0.063	-0.046	0.039	0.079	100.0
0.3	$R_{\perp\!\!\!\perp}$	cons.	0.4	0.4	0.0	0.0	559	0.759	0.000*	0.940	0.017*	-0.002	0.000	-0.002	3.799	-2.338	100.0
0.3	$R_{\perp\!\!\!\perp}$	cons.	0.4	0.4	0.0	0.0	559	0.773	0.000*	0.945	0.241	-0.001	0.002	-0.001	1.782	1.224	100.0
0.3	$R_{\perp\!\!\!\perp}$	cons.	0.4	0.4	0.3	0.3	508	0.773	0.000*	0.951	0.900	0.000	-0.002	-0.001	-0.009	-0.007	100.0
0.3	$R_{\perp\!\!\!\perp}$	cons.	0.4	0.4	0.3	0.3	508	0.784	0.016*	0.946	0.315	-0.002	0.001	-0.002	-0.242	-0.240	100.0
0.3	$R_{\perp\!\!\!\perp}$	cons.	0.4	0.4	0.6	0.6	358	0.794	0.225	0.945	0.241	0.003	0.002	0.002	0.006	0.004	100.0
0.3	$R_{\perp\!\!\!\perp}$	cons.	0.4	0.4	0.6	0.6	358	0.812	0.948	0.951	0.834	0.002	0.002	0.002	-0.122	-0.126	100.0
0.3	$R_{\perp\!\!\!\perp}$	cons.	0.4	0.4	0.8	0.8	201	0.808	0.869	0.948	0.557	-0.002	-0.002	-0.002	-0.001	0.000	100.0
0.3	$R_{\perp\!\!\!\perp}$	cons.	0.4	0.4	0.8	0.8	201	0.827	1.000	0.944	0.111	-0.001	-0.001	-0.001	-0.066	-0.066	100.0
0.3	$R_{\perp\!\!\!\perp}$	cons.	0.4	0.6	0.0	0.0	524	0.750	0.000*	0.947	0.402	0.002	-0.001	0.000	-8.223	-2.149	100.0
0.3	$R_{\perp\!\!\!\perp}$	cons.	0.4	0.6	0.0	0.0	524	0.757	0.000*	0.956	0.142	-0.000	0.001	-0.001	-0.724	-0.705	100.0
0.3	$R_{\perp\!\!\!\perp}$	cons.	0.4	0.6	0.3	0.3	477	0.763	0.000*	0.950	1.000	0.000	-0.003	-0.001	-0.002	-0.004	100.0
0.3	$R_{\perp\!\!\!\perp}$	cons.	0.4	0.6	0.3	0.3	477	0.775	0.000*	0.941	0.033*	0.003	-0.002	-0.002	-0.279	-0.282	100.0
0.3	$R_{\perp\!\!\!\perp}$	cons.	0.4	0.6	0.6	0.6	335	0.796	0.315	0.958	0.054	-0.001	-0.001	-0.000	0.000	-0.003	100.0
0.3	$R_{\perp\!\!\!\perp}$	cons.	0.4	0.6	0.6	0.6	335	0.806	0.800	0.951	0.900	-0.001	-0.000	0.002	-0.155	-0.154	100.0
0.3	$R_{\perp\!\!\!\perp}$	cons.	0.4	0.6	0.8	0.8	189	0.810	0.925	0.947	0.503	0.002	0.001	0.001	0.001	-0.002	100.0
0.3	$R_{\perp\!\!\!\perp}$	cons.	0.4	0.6	0.8	0.8	189	0.816	0.989	0.944	0.154	-0.002	-0.001	-0.001	-0.080	-0.081	100.0
0.3	$R_{\perp\!\!\!\perp}$	cons.	0.6	0.4	0.0	0.0	524	0.733	0.000*	0.956	0.142	-0.002	0.001	-0.000	2.060	-0.604	100.0
0.3	$R_{\perp\!\!\!\perp}$	cons.	0.6	0.4	0.0	0.0	524	0.755	0.000*	0.942	0.049*	-0.000	-0.001	-0.002	-0.014	0.821	100.0
0.3	$R_{\perp\!\!\!\perp}$	cons.	0.6	0.4	0.3	0.3	477	0.762	0.000*	0.946	0.276	-0.000	0.003	0.001	-0.005	-0.001	100.0
0.3	$R_{\perp\!\!\!\perp}$	cons.	0.6	0.4	0.3	0.3	477	0.771	0.000*	0.947	0.402	0.001	-0.001	-0.000	-0.278	-0.278	100.0
0.3	$R_{\perp\!\!\!\perp}$	cons.	0.6	0.4	0.6	0.6	335	0.780	0.004*	0.951	0.834	0.001	0.001	0.000	0.004	0.003	100.0
0.3	$R_{\perp\!\!\!\perp}$	cons.	0.6	0.4	0.6	0.6	335	0.797	0.331	0.939	0.007*	-0.001	0.002	0.001	-0.159	-0.159	100.0
0.3	$R_{\perp\!\!\!\perp}$	cons.	0.6	0.4	0.8	0.8	189	0.775	0.000*	0.935	0.000*	-0.002	-0.001	-0.001	0.001	0.001	100.0
0.3	$R_{\perp\!\!\!\perp}$	cons.	0.6	0.4	0.8	0.8	189	0.805	0.760	0.940	0.017*	0.003	0.003	0.003	-0.129	-0.131	100.0
0.3	$R_{\perp\!\!\!\perp}$	cons.	0.6	0.6	0.0	0.0	489	0.737	0.000*	0.950	1.000	0.002	0.002	-0.002	-0.764	-1.341	100.0
0.3	$R_{\perp\!\!\!\perp}$	cons.	0.6	0.6	0.0	0.0	489	0.737	0.000*	0.945	0.209	-0.001	0.001	-0.000	-44.120	-0.295	100.0
0.3	$R_{\perp\!\!\!\perp}$	cons.	0.6	0.6	0.3	0.3	445	0.743	0.000*	0.941	0.026*	0.001	-0.001	0.002	0.001	0.002	100.0
0.3	$R_{\perp\!\!\!\perp}$	cons.	0.6	0.6	0.3	0.3	445	0.763	0.000*	0.949	0.801	-0.003	-0.002	-0.001	-0.316	-0.320	100.0
0.3	$R_{\perp\!\!\!\perp}$	cons.	0.6	0.6	0.6	0.6	313	0.784	0.016*	0.937	0.002*	0.001	0.003	0.002	-0.001	0.001	100.0
0.3	$R_{\perp\!\!\!\perp}$	cons.	0.6	0.6	0.6	0.6	313	0.806	0.787	0.951	0.900	0.001	0.002	0.002	-0.177	-0.177	100.0
0.3	$R_{\perp\!\!\!\perp}$	cons.	0.6	0.6	0.8	0.8	176	0.777	0.001*	0.949	0.867	0.002	-0.001	0.001	-0.000	-0.001	100.0
0.3	$R_{\perp\!\!\!\perp}$	cons.	0.6	0.6	0.8	0.8	176	0.820	0.997	0.940	0.012*	0.004	0.005	0.004	-0.139	-0.141	100.0
0.3	$R_{\perp\!\!\!\perp}$	sharp	0.4	0.4	0.3	0.3	498	0.784	0.016*	0.952	0.586	-0.001	-0.002	-0.001	-0.241	-0.238	100.0
0.3	$R_{\perp\!\!\!\perp}$	sharp	0.4	0.4	0.3	0.3	498	0.771	0.000*	0.950	0.967	-0.001	0.002	-0.001	-0.002	-0.006	100.0
0.3	$R_{\perp\!\!\!\perp}$	sharp	0.4	0.4	0.6	0.6	339	0.781	0.005*	0.941	0.026*	-0.003	-0.001	-0.002	-0.135	-0.133	100.0
0.3	$R_{\perp\!\!\!\perp}$	sharp	0.4	0.4	0.6	0.6	339	0.772	0.000*	0.946	0.276	-0.002	-0.003	-0.002	-0.000	-0.007	100.0
0.3	$R_{\perp\!\!\!\perp}$	sharp	0.4	0.4	0.8	0.8	187	0.803	0.650	0.947	0.451	0.003	-0.000	0.001	-0.061	-0.062	100.0
0.3	$R_{\perp\!\!\!\perp}$	sharp	0.4	0.4	0.8	0.8	187	0.786	0.033*	0.949	0.867	-0.003	-0.001	-0.001	-0.001	0.001	100.0
0.3	$R_{\perp\!\!\!\perp}$	sharp	0.4	0.6	0.3	0.3	468	0.753	0.000*	0.947	0.451	-0.001	-0.002	-0.003	-0.282	-0.276	100.0

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Additional simulation results for design II when working assumption A1(a) is violated: responders' end-of-study variance is 25% below the appropriate lower bound.

δ	Response	Formula	r_{-1}	r_1	ρ	ρ_{size}	n	$1-\hat{\beta}$	p value	Coverage	p value	$\text{Cor}(R, Y_0^2)$	$\text{Cor}(R, Y_1^2)$	$\text{Cor}(R, Y_0 Y_1)$	$\text{Cov}(Y_0, Y_2)$	$\text{Cov}(Y_1, Y_2)$	% Valid
0.3	$R_{\perp\!\!\!\perp}$	sharp	0.4	0.6	0.3	0.3	468	0.766	0.000*	0.945	0.180	-0.000	-0.001	-0.002	-0.011	-0.001	100.0
0.3	$R_{\perp\!\!\!\perp}$	sharp	0.4	0.6	0.6	0.6	320	0.786	0.030*	0.947	0.451	-0.002	-0.002	-0.002	-0.160	-0.160	100.0
0.3	$R_{\perp\!\!\!\perp}$	sharp	0.4	0.6	0.6	0.6	320	0.764	0.000*	0.952	0.586	-0.003	-0.001	-0.001	-0.002	-0.006	100.0
0.3	$R_{\perp\!\!\!\perp}$	sharp	0.4	0.6	0.8	0.8	176	0.786	0.027*	0.948	0.675	0.001	0.003	0.002	-0.073	-0.072	100.0
0.3	$R_{\perp\!\!\!\perp}$	sharp	0.4	0.6	0.8	0.8	176	0.792	0.132	0.945	0.241	-0.001	-0.002	-0.002	0.001	-0.000	100.0
0.3	$R_{\perp\!\!\!\perp}$	sharp	0.6	0.4	0.3	0.3	468	0.763	0.000*	0.947	0.503	0.001	0.001	0.002	-0.276	-0.281	100.0
0.3	$R_{\perp\!\!\!\perp}$	sharp	0.6	0.4	0.3	0.3	468	0.757	0.000*	0.947	0.402	0.000	0.001	0.002	0.001	-0.001	100.0
0.3	$R_{\perp\!\!\!\perp}$	sharp	0.6	0.4	0.6	0.6	320	0.792	0.142	0.946	0.357	-0.001	-0.001	-0.001	-0.156	-0.155	100.0
0.3	$R_{\perp\!\!\!\perp}$	sharp	0.6	0.4	0.6	0.6	320	0.758	0.000*	0.949	0.737	0.003	0.001	0.001	0.003	0.005	100.0
0.3	$R_{\perp\!\!\!\perp}$	sharp	0.6	0.4	0.8	0.8	176	0.791	0.123	0.946	0.315	0.001	0.002	0.001	-0.135	-0.134	100.0
0.3	$R_{\perp\!\!\!\perp}$	sharp	0.6	0.4	0.8	0.8	176	0.754	0.000*	0.944	0.154	0.001	0.002	0.002	-0.001	-0.000	100.0
0.3	$R_{\perp\!\!\!\perp}$	sharp	0.6	0.6	0.3	0.3	438	0.751	0.000*	0.942	0.059	0.001	0.002	0.002	-0.315	-0.317	100.0
0.3	$R_{\perp\!\!\!\perp}$	sharp	0.6	0.6	0.3	0.3	438	0.743	0.000*	0.950	0.967	0.001	0.002	-0.002	0.002	-0.005	100.0
0.3	$R_{\perp\!\!\!\perp}$	sharp	0.6	0.6	0.6	0.6	301	0.787	0.040*	0.946	0.357	-0.001	-0.001	-0.002	-0.182	-0.182	100.0
0.3	$R_{\perp\!\!\!\perp}$	sharp	0.6	0.6	0.6	0.6	301	0.754	0.000*	0.941	0.021*	0.002	0.002	0.002	0.005	0.007	100.0
0.3	$R_{\perp\!\!\!\perp}$	sharp	0.6	0.6	0.8	0.8	166	0.789	0.064	0.943	0.071	0.002	0.003	0.003	-0.146	-0.146	100.0
0.3	$R_{\perp\!\!\!\perp}$	sharp	0.6	0.6	0.8	0.8	166	0.751	0.000*	0.949	0.737	0.002	0.002	0.002	-0.000	0.001	100.0
0.3	$R_+^{1\kappa}$	cons.	0.3	0.4	0.0	0.0	578	0.777	0.001*	0.952	0.706	-0.002	0.223	-0.001	-1.007	0.337	100.0
0.3	$R_+^{1\kappa}$	cons.	0.3	0.4	0.3	0.3	526	0.785	0.024*	0.949	0.867	0.019	0.222	0.089	-0.079	-0.384	100.0
0.3	$R_+^{1\kappa}$	cons.	0.3	0.4	0.6	0.6	370	0.806	0.813	0.950	0.933	0.081	0.223	0.162	-0.159	-0.383	100.0
0.3	$R_+^{1\kappa}$	cons.	0.5	0.6	0.0	0.0	510	0.760	0.000*	0.948	0.615	-0.001	-0.057	-0.001	-1.111	1.075	100.0
0.3	$R_+^{1\kappa}$	cons.	0.5	0.6	0.3	0.3	464	0.768	0.000*	0.947	0.503	-0.006	-0.060	-0.025	0.016	0.127	100.0
0.3	$R_+^{1\kappa}$	cons.	0.5	0.6	0.6	0.6	326	0.780	0.004*	0.937	0.001*	-0.022	-0.060	-0.043	0.039	0.124	100.0
0.3	$R_+^{1\kappa}$	sharp	0.3	0.4	0.3	0.3	515	0.781	0.005*	0.944	0.154	0.020	0.223	0.091	-0.064	-0.384	100.0
0.3	$R_+^{1\kappa}$	sharp	0.3	0.4	0.6	0.6	349	0.771	0.000*	0.949	0.737	0.081	0.226	0.163	-0.158	-0.383	100.0
0.3	$R_+^{1\kappa}$	sharp	0.5	0.6	0.3	0.3	456	0.784	0.016*	0.951	0.900	-0.004	-0.058	-0.023	0.027	0.136	100.0
0.3	$R_+^{1\kappa}$	sharp	0.5	0.6	0.6	0.6	312	0.789	0.064	0.951	0.900	-0.021	-0.061	-0.044	0.047	0.133	100.0
0.3	$R_-^{1\kappa}$	cons.	0.3	0.4	0.0	0.0	578	0.736	0.000*	0.950	1.000	-0.002	0.223	-0.001	-1.008	0.363	100.0
0.3	$R_-^{1\kappa}$	cons.	0.3	0.4	0.3	0.3	526	0.759	0.000*	0.948	0.675	0.019	0.222	0.089	-0.079	-0.384	100.0
0.3	$R_-^{1\kappa}$	cons.	0.3	0.4	0.6	0.6	370	0.783	0.010*	0.950	0.967	0.081	0.223	0.162	-0.159	-0.383	100.0
0.3	$R_-^{1\kappa}$	cons.	0.5	0.6	0.0	0.0	510	0.691	0.000*	0.948	0.615	-0.001	-0.057	-0.001	-1.124	1.070	100.0
0.3	$R_-^{1\kappa}$	cons.	0.5	0.6	0.3	0.3	464	0.717	0.000*	0.946	0.276	-0.006	-0.060	-0.025	0.015	0.127	100.0
0.3	$R_-^{1\kappa}$	cons.	0.5	0.6	0.6	0.6	326	0.671	0.000*	0.937	0.001*	-0.022	-0.060	-0.043	0.040	0.125	100.0
0.3	$R_-^{1\kappa}$	sharp	0.3	0.4	0.3	0.3	515	0.752	0.000*	0.944	0.154	0.020	0.223	0.091	-0.064	-0.384	100.0
0.3	$R_-^{1\kappa}$	sharp	0.3	0.4	0.6	0.6	349	0.750	0.000*	0.951	0.900	0.081	0.226	0.163	-0.158	-0.383	100.0
0.3	$R_-^{1\kappa}$	sharp	0.5	0.6	0.3	0.3	456	0.729	0.000*	0.952	0.645	-0.004	-0.058	-0.023	0.027	0.136	100.0
0.3	$R_-^{1\kappa}$	sharp	0.5	0.6	0.6	0.6	312	0.668	0.000*	0.948	0.675	-0.021	-0.061	-0.044	0.048	0.134	100.0
0.3	$R_+^{2\kappa}$	cons.	0.4	0.4	0.0	0.0	559	0.764	0.000*	0.951	0.834	0.000	0.145	-0.001	-1.455	4.931	100.0
0.3	$R_+^{2\kappa}$	cons.	0.4	0.4	0.3	0.3	508	0.787	0.044*	0.951	0.834	0.013	0.144	0.058	-0.053	-0.257	100.0
0.3	$R_+^{2\kappa}$	cons.	0.4	0.4	0.6	0.6	358	0.799	0.471	0.939	0.009*	0.051	0.144	0.105	-0.101	-0.261	100.0
0.3	$R_+^{2\kappa}$	cons.	0.4	0.6	0.0	0.0	524	0.751	0.000*	0.942	0.049*	-0.002	0.001	0.002	3.295	-0.810	100.0
0.3	$R_+^{2\kappa}$	cons.	0.4	0.6	0.3	0.3	477	0.777	0.001*	0.949	0.867	-0.001	-0.003	0.002	0.009	0.002	100.0
0.3	$R_+^{2\kappa}$	cons.	0.4	0.6	0.6	0.6	335	0.809	0.896	0.949	0.867	-0.002	-0.002	-0.002	-0.004	-0.009	100.0
0.3	$R_+^{2\kappa}$	cons.	0.6	0.4	0.0	0.0	524	0.753	0.000*	0.951	0.769	-0.001	-0.001	0.002	0.029	1.119	100.0
0.3	$R_+^{2\kappa}$	cons.	0.6	0.4	0.3	0.3	477	0.773	0.000*	0.950	0.933	-0.001	-0.004	0.001	0.002	0.007	100.0

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Additional simulation results for design II when working assumption A1(a) is violated: responders' end-of-study variance is 25% below the appropriate lower bound.

δ	Response	Formula	r_{-1}	r_1	ρ	ρ_{size}	n	$1-\hat{\beta}$	p value	Coverage	p value	$\text{Cor}(R, Y_0^2)$	$\text{Cor}(R, Y_1^2)$	$\text{Cor}(R, Y_0Y_1)$	$\text{Cov}(Y_0, Y_2)$	$\text{Cov}(Y_1, Y_2)$	% Valid
0.3	$R_+^{2\kappa}$	cons.	0.6	0.4	0.6	0.6	335	0.780	0.004*	0.947	0.402	-0.002	-0.002	-0.002	-0.003	-0.004	100.0
0.3	$R_+^{2\kappa}$	cons.	0.6	0.6	0.0	0.0	489	0.732	0.000*	0.944	0.154	0.000	-0.143	0.001	1.206	4.208	100.0
0.3	$R_+^{2\kappa}$	cons.	0.6	0.6	0.3	0.3	445	0.758	0.000*	0.943	0.094	-0.014	-0.145	-0.060	0.054	0.360	100.0
0.3	$R_+^{2\kappa}$	cons.	0.6	0.6	0.6	0.6	313	0.790	0.097	0.945	0.209	-0.054	-0.144	-0.106	0.118	0.365	100.0
0.3	$R_+^{2\kappa}$	sharp	0.4	0.4	0.3	0.3	498	0.759	0.000*	0.944	0.132	0.012	0.145	0.058	-0.032	-0.262	100.0
0.3	$R_+^{2\kappa}$	sharp	0.4	0.4	0.6	0.6	339	0.781	0.005*	0.945	0.241	0.052	0.146	0.105	-0.103	-0.258	100.0
0.3	$R_+^{2\kappa}$	sharp	0.4	0.6	0.3	0.3	468	0.764	0.000*	0.949	0.867	0.002	0.004	-0.002	0.015	0.007	100.0
0.3	$R_+^{2\kappa}$	sharp	0.4	0.6	0.6	0.6	320	0.794	0.225	0.942	0.059	-0.001	-0.003	-0.001	0.004	0.003	100.0
0.3	$R_+^{2\kappa}$	sharp	0.6	0.4	0.3	0.3	468	0.777	0.001*	0.942	0.049*	0.001	0.004	-0.002	0.009	-0.006	100.0
0.3	$R_+^{2\kappa}$	sharp	0.6	0.4	0.6	0.6	320	0.769	0.000*	0.953	0.530	0.002	-0.001	-0.001	0.004	0.001	100.0
0.3	$R_+^{2\kappa}$	sharp	0.6	0.6	0.3	0.3	438	0.757	0.000*	0.954	0.379	-0.014	-0.143	-0.058	0.036	0.374	100.0
0.3	$R_+^{2\kappa}$	sharp	0.6	0.6	0.6	0.6	301	0.775	0.000*	0.949	0.801	-0.050	-0.145	-0.105	0.125	0.368	100.0
0.3	$R_-^{2\kappa}$	cons.	0.4	0.4	0.0	0.0	559	0.764	0.000*	0.951	0.834	0.000	0.145	-0.001	-1.456	4.932	100.0
0.3	$R_-^{2\kappa}$	cons.	0.4	0.4	0.3	0.3	508	0.789	0.076	0.951	0.900	0.013	0.144	0.058	-0.053	-0.257	100.0
0.3	$R_-^{2\kappa}$	cons.	0.4	0.4	0.6	0.6	358	0.812	0.953	0.941	0.021*	0.051	0.144	0.105	-0.101	-0.261	100.0
0.3	$R_-^{2\kappa}$	cons.	0.4	0.4	0.8	0.8	201	0.818	0.994	0.944	0.111	0.096	0.147	0.131	-0.163	-0.257	100.0
0.3	$R_-^{2\kappa}$	cons.	0.4	0.6	0.0	0.0	524	0.751	0.000*	0.942	0.049*	-0.002	0.001	0.002	3.293	-0.810	100.0
0.3	$R_-^{2\kappa}$	cons.	0.4	0.6	0.3	0.3	477	0.775	0.000*	0.950	1.000	-0.001	-0.003	0.002	0.009	0.002	100.0
0.3	$R_-^{2\kappa}$	cons.	0.4	0.6	0.6	0.6	335	0.805	0.745	0.950	0.933	-0.002	-0.002	-0.002	-0.003	-0.008	100.0
0.3	$R_-^{2\kappa}$	cons.	0.4	0.6	0.8	0.8	189	0.810	0.925	0.942	0.049*	0.002	0.001	0.002	0.003	0.002	100.0
0.3	$R_-^{2\kappa}$	cons.	0.6	0.4	0.0	0.0	524	0.753	0.000*	0.951	0.769	-0.001	-0.001	0.002	0.030	1.119	100.0
0.3	$R_-^{2\kappa}$	cons.	0.6	0.4	0.3	0.3	477	0.773	0.000*	0.950	0.933	-0.001	-0.004	0.001	0.002	0.007	100.0
0.3	$R_-^{2\kappa}$	cons.	0.6	0.4	0.6	0.6	335	0.776	0.001*	0.947	0.503	-0.002	-0.002	-0.002	-0.003	-0.004	100.0
0.3	$R_-^{2\kappa}$	cons.	0.6	0.6	0.0	0.0	489	0.732	0.000*	0.944	0.154	0.000	-0.143	0.001	1.206	4.202	100.0
0.3	$R_-^{2\kappa}$	cons.	0.6	0.6	0.3	0.3	445	0.756	0.000*	0.944	0.111	-0.014	-0.145	-0.060	0.054	0.360	100.0
0.3	$R_-^{2\kappa}$	cons.	0.6	0.6	0.6	0.6	313	0.775	0.000*	0.943	0.094	-0.054	-0.144	-0.106	0.118	0.365	100.0
0.3	$R_-^{2\kappa}$	sharp	0.4	0.4	0.3	0.3	498	0.761	0.000*	0.944	0.132	0.012	0.145	0.058	-0.032	-0.262	100.0
0.3	$R_-^{2\kappa}$	sharp	0.4	0.4	0.6	0.6	339	0.793	0.175	0.945	0.180	0.052	0.146	0.105	-0.103	-0.258	100.0
0.3	$R_-^{2\kappa}$	sharp	0.4	0.4	0.8	0.8	187	0.791	0.114	0.948	0.557	0.094	0.145	0.129	-0.170	-0.261	100.0
0.3	$R_-^{2\kappa}$	sharp	0.4	0.6	0.3	0.3	468	0.763	0.000*	0.950	0.933	0.002	0.004	-0.002	0.015	0.007	100.0
0.3	$R_-^{2\kappa}$	sharp	0.4	0.6	0.6	0.6	320	0.785	0.020*	0.944	0.154	-0.001	-0.003	-0.001	0.005	0.003	100.0
0.3	$R_-^{2\kappa}$	sharp	0.4	0.6	0.8	0.8	176	0.793	0.175	0.946	0.276	0.001	0.002	0.001	0.007	0.013	100.0
0.3	$R_-^{2\kappa}$	sharp	0.6	0.4	0.3	0.3	468	0.776	0.001*	0.942	0.049*	0.001	0.004	-0.002	0.009	-0.006	100.0
0.3	$R_-^{2\kappa}$	sharp	0.6	0.4	0.6	0.6	320	0.760	0.000*	0.953	0.476	0.002	-0.001	-0.001	0.004	0.001	100.0
0.3	$R_-^{2\kappa}$	sharp	0.6	0.6	0.3	0.3	438	0.756	0.000*	0.954	0.379	-0.014	-0.143	-0.058	0.036	0.374	100.0
0.3	$R_-^{2\kappa}$	sharp	0.6	0.6	0.6	0.6	301	0.761	0.000*	0.950	0.967	-0.050	-0.145	-0.105	0.125	0.368	100.0
0.5	R_+	cons.	0.4	0.4	0.0	0.0	201	0.768	0.000*	0.947	0.503	0.002	0.078	-0.001	-4.671	-0.374	100.0
0.5	R_+	cons.	0.4	0.4	0.3	0.3	183	0.790	0.097	0.941	0.021*	0.007	0.077	0.031	-0.032	-0.111	100.0
0.5	R_+	cons.	0.4	0.4	0.6	0.6	129	0.810	0.912	0.931	0.000*	0.028	0.078	0.058	-0.048	-0.101	100.0
0.5	R_+	cons.	0.4	0.4	0.8	0.8	73	0.829	1.000	0.934	0.000*	0.052	0.084	0.075	-0.088	-0.112	100.0
0.5	R_+	cons.	0.4	0.6	0.0	0.0	189	0.761	0.000*	0.938	0.003*	0.003	0.011	0.002	-2.391	-1.271	100.0
0.5	R_+	cons.	0.4	0.6	0.3	0.3	172	0.801	0.562	0.945	0.209	-0.001	0.010	0.005	-0.002	-0.016	100.0
0.5	R_+	cons.	0.4	0.6	0.6	0.6	121	0.793	0.186	0.930	0.000*	0.005	0.011	0.008	-0.003	-0.014	100.0
0.5	R_+	cons.	0.4	0.6	0.8	0.8	68	0.783	0.010*	0.935	0.000*	0.009	0.010	0.010	-0.007	-0.003	99.9
0.5	R_+	cons.	0.6	0.4	0.0	0.0	189	0.755	0.000*	0.943	0.094	-0.003	0.011	0.004	0.955	-0.203	100.0

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Additional simulation results for design II when working assumption A1(a) is violated: responders' end-of-study variance is 25% below the appropriate lower bound.

δ	Response	Formula	r_{-1}	r_1	ρ	ρ_{size}	n	$1-\hat{\beta}$	p value	Coverage	p value	$\text{Cor}(R, Y_0^2)$	$\text{Cor}(R, Y_1^2)$	$\text{Cor}(R, Y_0Y_1)$	$\text{Cov}(Y_0, Y_2)$	$\text{Cov}(Y_1, Y_2)$	% Valid
0.5	R_+	cons.	0.6	0.4	0.3	0.3	172	0.779	0.003*	0.945	0.180	0.002	0.013	0.004	-0.016	0.003	100.0
0.5	R_+	cons.	0.6	0.4	0.6	0.6	121	0.810	0.912	0.937	0.002*	0.007	0.012	0.009	0.002	-0.002	100.0
0.5	R_+	cons.	0.6	0.4	0.8	0.8	68	0.799	0.449	0.927	0.000*	0.012	0.014	0.016	-0.008	-0.010	99.8
0.5	R_+	cons.	0.6	0.6	0.0	0.0	176	0.733	0.000*	0.946	0.357	-0.005	-0.061	-0.003	-0.951	-7.762	100.0
0.5	R_+	cons.	0.6	0.6	0.3	0.3	160	0.767	0.000*	0.936	0.001*	-0.006	-0.060	-0.025	0.022	0.090	100.0
0.5	R_+	cons.	0.6	0.6	0.6	0.6	113	0.792	0.152	0.943	0.086	-0.022	-0.060	-0.043	0.045	0.095	100.0
0.5	R_+	cons.	0.6	0.6	0.8	0.8	64	0.783	0.010*	0.931	0.000*	-0.036	-0.058	-0.051	0.108	0.136	99.6
0.5	R_+	sharp	0.4	0.4	0.3	0.3	180	0.777	0.001*	0.941	0.033*	0.006	0.080	0.035	-0.018	-0.092	100.0
0.5	R_+	sharp	0.4	0.4	0.6	0.6	122	0.791	0.123	0.940	0.012*	0.027	0.078	0.057	-0.057	-0.100	100.0
0.5	R_+	sharp	0.4	0.4	0.8	0.8	67	0.784	0.018*	0.927	0.000*	0.053	0.084	0.073	-0.087	-0.109	100.0
0.5	R_+	sharp	0.4	0.6	0.3	0.3	169	0.765	0.000*	0.938	0.003*	0.003	0.009	0.003	0.002	0.016	100.0
0.5	R_+	sharp	0.4	0.6	0.6	0.6	115	0.786	0.027*	0.936	0.000*	0.006	0.011	0.008	-0.001	-0.008	100.0
0.5	R_+	sharp	0.4	0.6	0.8	0.8	64	0.770	0.000*	0.935	0.000*	0.008	0.012	0.012	0.012	0.008	99.8
0.5	R_+	sharp	0.6	0.4	0.3	0.3	169	0.757	0.000*	0.937	0.002*	-0.005	0.012	0.004	-0.008	-0.023	100.0
0.5	R_+	sharp	0.6	0.4	0.6	0.6	115	0.793	0.175	0.939	0.007*	0.007	0.014	0.010	-0.017	-0.017	100.0
0.5	R_+	sharp	0.6	0.4	0.8	0.8	64	0.791	0.106	0.932	0.000*	0.011	0.015	0.015	0.007	0.009	99.7
0.5	R_+	sharp	0.6	0.6	0.3	0.3	158	0.769	0.000*	0.943	0.086	-0.008	-0.062	-0.026	0.008	0.058	100.0
0.5	R_+	sharp	0.6	0.6	0.6	0.6	109	0.793	0.163	0.940	0.013*	-0.019	-0.059	-0.041	0.052	0.082	100.0
0.5	R_+	sharp	0.6	0.6	0.8	0.8	60	0.767	0.000*	0.926	0.000*	-0.040	-0.063	-0.056	0.102	0.134	99.2
0.5	$R_{\perp\!\!\!\perp}$	cons.	0.4	0.4	0.0	0.0	201	0.762	0.000*	0.947	0.402	-0.002	-0.001	0.001	2.752	0.703	100.0
0.5	$R_{\perp\!\!\!\perp}$	cons.	0.4	0.4	0.0	0.0	201	0.765	0.000*	0.944	0.132	-0.001	-0.001	-0.002	-0.779	0.710	100.0
0.5	$R_{\perp\!\!\!\perp}$	cons.	0.4	0.4	0.3	0.3	183	0.782	0.008*	0.942	0.049*	0.002	-0.000	0.003	0.012	-0.005	100.0
0.5	$R_{\perp\!\!\!\perp}$	cons.	0.4	0.4	0.3	0.3	183	0.785	0.024*	0.950	0.933	-0.002	0.006	-0.000	-0.245	-0.240	100.0
0.5	$R_{\perp\!\!\!\perp}$	cons.	0.4	0.4	0.6	0.6	129	0.791	0.123	0.937	0.002*	-0.001	0.004	0.001	0.011	0.010	100.0
0.5	$R_{\perp\!\!\!\perp}$	cons.	0.4	0.4	0.6	0.6	129	0.819	0.997	0.937	0.001*	-0.005	-0.002	-0.004	-0.144	-0.142	100.0
0.5	$R_{\perp\!\!\!\perp}$	cons.	0.4	0.4	0.8	0.8	73	0.811	0.943	0.934	0.000*	0.002	0.005	0.005	0.003	-0.000	100.0
0.5	$R_{\perp\!\!\!\perp}$	cons.	0.4	0.4	0.8	0.8	73	0.828	1.000	0.941	0.033*	0.004	-0.004	-0.003	-0.067	-0.068	100.0
0.5	$R_{\perp\!\!\!\perp}$	cons.	0.4	0.6	0.0	0.0	189	0.766	0.000*	0.947	0.402	0.002	0.004	-0.001	-2.102	-1.542	100.0
0.5	$R_{\perp\!\!\!\perp}$	cons.	0.4	0.6	0.0	0.0	189	0.754	0.000*	0.937	0.002*	-0.003	-0.001	0.001	-0.520	2.436	100.0
0.5	$R_{\perp\!\!\!\perp}$	cons.	0.4	0.6	0.3	0.3	172	0.775	0.000*	0.945	0.209	-0.003	0.005	0.002	-0.006	0.019	100.0
0.5	$R_{\perp\!\!\!\perp}$	cons.	0.4	0.6	0.3	0.3	172	0.781	0.005*	0.937	0.001*	-0.000	0.002	0.003	-0.284	-0.277	100.0
0.5	$R_{\perp\!\!\!\perp}$	cons.	0.4	0.6	0.6	0.6	121	0.773	0.000*	0.944	0.111	0.002	0.003	0.002	-0.002	0.003	100.0
0.5	$R_{\perp\!\!\!\perp}$	cons.	0.4	0.6	0.6	0.6	121	0.805	0.774	0.949	0.737	-0.002	-0.000	0.001	-0.164	-0.160	100.0
0.5	$R_{\perp\!\!\!\perp}$	cons.	0.4	0.6	0.8	0.8	68	0.800	0.522	0.932	0.000*	-0.004	-0.001	-0.002	0.004	0.009	100.0
0.5	$R_{\perp\!\!\!\perp}$	cons.	0.4	0.6	0.8	0.8	68	0.830	1.000	0.935	0.000*	0.002	0.003	0.002	-0.064	-0.062	99.9
0.5	$R_{\perp\!\!\!\perp}$	cons.	0.6	0.4	0.0	0.0	189	0.749	0.000*	0.942	0.040*	-0.002	-0.004	0.001	1.375	-2.346	100.0
0.5	$R_{\perp\!\!\!\perp}$	cons.	0.6	0.4	0.0	0.0	189	0.757	0.000*	0.939	0.009*	0.002	-0.002	0.001	-0.095	-1.839	100.0
0.5	$R_{\perp\!\!\!\perp}$	cons.	0.6	0.4	0.3	0.3	172	0.772	0.000*	0.947	0.402	0.003	-0.005	-0.002	-0.000	-0.011	100.0
0.5	$R_{\perp\!\!\!\perp}$	cons.	0.6	0.4	0.3	0.3	172	0.767	0.000*	0.939	0.007*	0.003	0.003	-0.000	-0.284	-0.281	100.0
0.5	$R_{\perp\!\!\!\perp}$	cons.	0.6	0.4	0.6	0.6	121	0.787	0.040*	0.944	0.132	-0.002	-0.003	-0.002	-0.011	-0.006	100.0
0.5	$R_{\perp\!\!\!\perp}$	cons.	0.6	0.4	0.6	0.6	121	0.801	0.558	0.942	0.049*	0.003	0.002	0.002	-0.158	-0.159	100.0
0.5	$R_{\perp\!\!\!\perp}$	cons.	0.6	0.4	0.8	0.8	68	0.791	0.112	0.929	0.000*	0.004	0.001	0.002	0.024	0.020	99.8
0.5	$R_{\perp\!\!\!\perp}$	cons.	0.6	0.4	0.8	0.8	68	0.832	1.000	0.933	0.000*	-0.004	-0.006	-0.004	-0.137	-0.142	99.9
0.5	$R_{\perp\!\!\!\perp}$	cons.	0.6	0.6	0.0	0.0	176	0.747	0.000*	0.948	0.675	0.002	-0.002	-0.002	-2.223	8.677	100.0
0.5	$R_{\perp\!\!\!\perp}$	cons.	0.6	0.6	0.0	0.0	176	0.741	0.000*	0.944	0.132	0.003	0.002	0.003	0.651	-0.711	100.0

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Additional simulation results for design II when working assumption A1(a) is violated: responders' end-of-study variance is 25% below the appropriate lower bound.

δ	Response	Formula	r_{-1}	r_1	ρ	ρ_{size}	n	$1-\hat{\beta}$	p value	Coverage	p value	$\text{Cor}(R, Y_0^2)$	$\text{Cor}(R, Y_1^2)$	$\text{Cor}(R, Y_0 Y_1)$	$\text{Cov}(Y_0, Y_2)$	$\text{Cov}(Y_1, Y_2)$	% Valid
0.5	$R_{\perp\!\!\perp}$	cons.	0.6	0.6	0.3	0.3	160	0.767	0.000*	0.945	0.241	0.004	-0.002	0.003	0.016	0.012	100.0
0.5	$R_{\perp\!\!\perp}$	cons.	0.6	0.6	0.3	0.3	160	0.767	0.000*	0.951	0.834	0.002	-0.003	-0.004	-0.321	-0.333	100.0
0.5	$R_{\perp\!\!\perp}$	cons.	0.6	0.6	0.6	0.6	113	0.788	0.049*	0.932	0.000*	0.001	0.001	-0.000	0.001	-0.002	100.0
0.5	$R_{\perp\!\!\perp}$	cons.	0.6	0.6	0.6	0.6	113	0.799	0.471	0.938	0.004*	0.005	0.004	0.004	-0.173	-0.177	100.0
0.5	$R_{\perp\!\!\perp}$	cons.	0.6	0.6	0.8	0.8	64	0.792	0.129	0.926	0.000*	-0.002	-0.006	-0.004	0.030	0.028	99.5
0.5	$R_{\perp\!\!\perp}$	cons.	0.6	0.6	0.8	0.8	64	0.825	1.000	0.934	0.000*	0.002	0.003	0.002	-0.111	-0.111	99.6
0.5	$R_{\perp\!\!\perp}$	sharp	0.4	0.4	0.3	0.3	180	0.772	0.000*	0.943	0.086	-0.002	0.002	0.004	-0.228	-0.232	100.0
0.5	$R_{\perp\!\!\perp}$	sharp	0.4	0.4	0.3	0.3	180	0.769	0.000*	0.935	0.000*	-0.001	-0.003	-0.003	-0.002	-0.021	100.0
0.5	$R_{\perp\!\!\perp}$	sharp	0.4	0.4	0.6	0.6	122	0.812	0.953	0.943	0.086	0.002	0.003	0.002	-0.130	-0.127	100.0
0.5	$R_{\perp\!\!\perp}$	sharp	0.4	0.4	0.6	0.6	122	0.784	0.014*	0.949	0.867	-0.002	0.004	-0.003	-0.001	-0.003	100.0
0.5	$R_{\perp\!\!\perp}$	sharp	0.4	0.4	0.8	0.8	67	0.793	0.163	0.921	0.000*	0.002	0.002	0.004	-0.066	-0.066	100.0
0.5	$R_{\perp\!\!\perp}$	sharp	0.4	0.4	0.8	0.8	67	0.793	0.163	0.928	0.000*	0.001	0.003	0.003	0.008	0.012	100.0
0.5	$R_{\perp\!\!\perp}$	sharp	0.4	0.6	0.3	0.3	169	0.778	0.002*	0.952	0.706	-0.004	-0.002	-0.003	-0.289	-0.289	100.0
0.5	$R_{\perp\!\!\perp}$	sharp	0.4	0.6	0.3	0.3	169	0.748	0.000*	0.938	0.003*	0.005	-0.003	-0.002	-0.009	-0.012	100.0
0.5	$R_{\perp\!\!\perp}$	sharp	0.4	0.6	0.6	0.6	115	0.777	0.001*	0.941	0.026*	-0.003	-0.001	-0.003	-0.163	-0.157	100.0
0.5	$R_{\perp\!\!\perp}$	sharp	0.4	0.6	0.6	0.6	115	0.783	0.010*	0.947	0.402	0.004	-0.001	0.004	-0.001	0.003	100.0
0.5	$R_{\perp\!\!\perp}$	sharp	0.4	0.6	0.8	0.8	64	0.821	0.998	0.931	0.000*	0.004	0.003	0.003	-0.054	-0.053	99.7
0.5	$R_{\perp\!\!\perp}$	sharp	0.4	0.6	0.8	0.8	64	0.795	0.244	0.939	0.006*	-0.001	0.004	0.003	0.009	0.008	99.7
0.5	$R_{\perp\!\!\perp}$	sharp	0.6	0.4	0.3	0.3	169	0.766	0.000*	0.944	0.111	0.003	0.004	0.002	-0.277	-0.280	100.0
0.5	$R_{\perp\!\!\perp}$	sharp	0.6	0.4	0.3	0.3	169	0.751	0.000*	0.939	0.009*	-0.005	0.003	0.002	-0.002	0.010	100.0
0.5	$R_{\perp\!\!\perp}$	sharp	0.6	0.4	0.6	0.6	115	0.780	0.003*	0.931	0.000*	-0.003	-0.004	-0.002	-0.159	-0.155	100.0
0.5	$R_{\perp\!\!\perp}$	sharp	0.6	0.4	0.6	0.6	115	0.774	0.000*	0.938	0.003*	-0.004	0.001	-0.004	-0.009	-0.008	100.0
0.5	$R_{\perp\!\!\perp}$	sharp	0.6	0.4	0.8	0.8	64	0.801	0.536	0.934	0.000*	0.000	-0.002	0.001	-0.117	-0.120	99.8
0.5	$R_{\perp\!\!\perp}$	sharp	0.6	0.4	0.8	0.8	64	0.770	0.000*	0.932	0.000*	0.001	-0.004	-0.002	0.007	0.006	99.9
0.5	$R_{\perp\!\!\perp}$	sharp	0.6	0.6	0.3	0.3	158	0.773	0.000*	0.937	0.002*	-0.002	0.002	-0.002	-0.327	-0.323	100.0
0.5	$R_{\perp\!\!\perp}$	sharp	0.6	0.6	0.3	0.3	158	0.767	0.000*	0.933	0.000*	-0.000	-0.001	0.002	0.001	-0.002	100.0
0.5	$R_{\perp\!\!\perp}$	sharp	0.6	0.6	0.6	0.6	109	0.798	0.382	0.945	0.180	0.003	0.003	-0.003	-0.187	-0.192	100.0
0.5	$R_{\perp\!\!\perp}$	sharp	0.6	0.6	0.6	0.6	109	0.767	0.000*	0.937	0.002*	0.001	0.007	0.005	0.008	0.016	100.0
0.5	$R_{\perp\!\!\perp}$	sharp	0.6	0.6	0.8	0.8	60	0.796	0.276	0.937	0.001*	0.003	0.005	0.004	-0.090	-0.091	99.3
0.5	$R_{\perp\!\!\perp}$	sharp	0.6	0.6	0.8	0.8	60	0.774	0.000*	0.931	0.000*	0.003	0.003	0.002	0.050	0.052	99.3
0.5	$R_{+}^{1\kappa}$	cons.	0.3	0.4	0.0	0.0	210	0.778	0.002*	0.942	0.059	0.003	0.241	0.000	-1.357	-1.917	100.0
0.5	$R_{+}^{1\kappa}$	cons.	0.3	0.4	0.3	0.3	191	0.794	0.199	0.941	0.026*	0.020	0.241	0.097	-0.058	-0.406	100.0
0.5	$R_{+}^{1\kappa}$	cons.	0.5	0.6	0.0	0.0	185	0.763	0.000*	0.944	0.154	0.001	-0.042	0.001	-2.362	2.981	100.0
0.5	$R_{+}^{1\kappa}$	cons.	0.5	0.6	0.3	0.3	169	0.783	0.010*	0.943	0.071	-0.006	-0.041	-0.017	0.003	0.085	100.0
0.5	$R_{+}^{1\kappa}$	cons.	0.5	0.6	0.6	0.6	119	0.811	0.932	0.947	0.402	-0.019	-0.044	-0.034	0.023	0.090	100.0
0.5	$R_{+}^{1\kappa}$	sharp	0.3	0.4	0.3	0.3	187	0.772	0.000*	0.944	0.154	0.022	0.242	0.098	-0.070	-0.398	100.0
0.5	$R_{+}^{1\kappa}$	sharp	0.5	0.6	0.3	0.3	166	0.763	0.000*	0.946	0.357	-0.004	-0.042	-0.018	0.023	0.092	100.0
0.5	$R_{+}^{1\kappa}$	sharp	0.5	0.6	0.6	0.6	114	0.796	0.315	0.943	0.086	-0.015	-0.045	-0.034	0.034	0.091	100.0
0.5	$R_{+}^{2\kappa}$	cons.	0.4	0.4	0.0	0.0	201	0.761	0.000*	0.941	0.033*	-0.002	0.147	0.002	0.697	-3.907	100.0
0.5	$R_{+}^{2\kappa}$	cons.	0.4	0.4	0.3	0.3	183	0.788	0.058	0.942	0.049*	0.016	0.146	0.060	-0.044	-0.269	100.0
0.5	$R_{+}^{2\kappa}$	cons.	0.4	0.4	0.6	0.6	129	0.801	0.544	0.944	0.132	0.052	0.150	0.107	-0.101	-0.260	100.0
0.5	$R_{+}^{2\kappa}$	cons.	0.4	0.6	0.0	0.0	189	0.762	0.000*	0.936	0.000*	-0.001	-0.001	-0.002	-3.650	-0.922	100.0
0.5	$R_{+}^{2\kappa}$	cons.	0.4	0.6	0.3	0.3	172	0.788	0.058	0.939	0.009*	0.000	-0.007	-0.004	0.008	0.014	100.0
0.5	$R_{+}^{2\kappa}$	cons.	0.4	0.6	0.6	0.6	121	0.809	0.887	0.935	0.000*	-0.001	-0.003	0.002	0.010	0.002	100.0
0.5	$R_{+}^{2\kappa}$	cons.	0.6	0.4	0.0	0.0	189	0.763	0.000*	0.943	0.086	0.002	-0.001	0.002	-1.460	0.110	100.0

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Additional simulation results for design II when working assumption A1(a) is violated: responders' end-of-study variance is 25% below the appropriate lower bound.

δ	Response	Formula	r_{-1}	r_1	ρ	ρ_{size}	n	$1-\hat{\beta}$	p value	Coverage	p value	$\text{Cor}(R, Y_0^2)$	$\text{Cor}(R, Y_1^2)$	$\text{Cor}(R, Y_0 Y_1)$	$\text{Cov}(Y_0, Y_2)$	$\text{Cov}(Y_1, Y_2)$	% Valid
0.5	$R_+^{2\kappa}$	cons.	0.6	0.4	0.3	0.3	172	0.775	0.000^*	0.944	0.132	0.001	0.005	-0.002	0.008	0.002	100.0
0.5	$R_+^{2\kappa}$	cons.	0.6	0.4	0.6	0.6	121	0.801	0.544	0.943	0.086	-0.001	-0.003	-0.001	-0.010	-0.021	100.0
0.5	$R_+^{2\kappa}$	cons.	0.6	0.6	0.0	0.0	176	0.747	0.000^*	0.946	0.315	0.002	-0.146	0.004	-0.865	-0.536	100.0
0.5	$R_+^{2\kappa}$	cons.	0.6	0.6	0.3	0.3	160	0.777	0.001^*	0.947	0.503	-0.015	-0.149	-0.060	0.035	0.312	100.0
0.5	$R_+^{2\kappa}$	cons.	0.6	0.6	0.6	0.6	113	0.804	0.715	0.944	0.154	-0.053	-0.158	-0.113	0.128	0.347	100.0
0.5	$R_+^{2\kappa}$	sharp	0.4	0.4	0.3	0.3	180	0.780	0.003^*	0.944	0.111	0.015	0.147	0.060	-0.031	-0.252	100.0
0.5	$R_+^{2\kappa}$	sharp	0.4	0.4	0.6	0.6	122	0.777	0.001^*	0.940	0.013^*	0.053	0.147	0.107	-0.101	-0.269	100.0
0.5	$R_+^{2\kappa}$	sharp	0.4	0.6	0.3	0.3	169	0.774	0.000^*	0.941	0.026^*	0.004	0.003	-0.001	0.004	-0.004	100.0
0.5	$R_+^{2\kappa}$	sharp	0.4	0.6	0.6	0.6	115	0.792	0.152	0.940	0.012^*	-0.004	-0.009	-0.007	-0.004	-0.011	100.0
0.5	$R_+^{2\kappa}$	sharp	0.6	0.4	0.3	0.3	169	0.767	0.000^*	0.937	0.002^*	0.004	0.002	-0.001	-0.001	-0.010	100.0
0.5	$R_+^{2\kappa}$	sharp	0.6	0.4	0.6	0.6	115	0.780	0.003^*	0.938	0.003^*	-0.002	-0.007	-0.005	0.003	-0.001	100.0
0.5	$R_+^{2\kappa}$	sharp	0.6	0.6	0.3	0.3	158	0.755	0.000^*	0.941	0.021^*	-0.011	-0.145	-0.059	0.029	0.338	100.0

Table S11: Additional simulation results for design II when working assumption A1(b) is violated: response is highly correlated with $(Y_1^{(d)} - \mu_1^{(d)})^2$

δ	Response	Formula	r_{-1}	r_1	ρ	ρ_{size}	n	$1-\hat{\beta}$	p value	Coverage	p value	$\text{Cor}(R, Y_0^2)$	$\text{Cor}(R, Y_1^2)$	$\text{Cor}(R, Y_0Y_1)$	$\text{Cov}(Y_0, Y_2)$	$\text{Cov}(Y_1, Y_2)$	% Valid
0.3	R_+^2	cons.	0.4	0.4	0.0	0.0	559	0.803	0.650	0.944	0.154	0.000	0.688	-0.002	8.049	2.539	100.0
0.3	R_+^2	cons.	0.4	0.4	0.3	0.3	508	0.797	0.331	0.940	0.013*	0.063	0.689	0.277	0.792	9.124	100.0
0.3	R_+^2	cons.	0.4	0.4	0.6	0.6	358	0.759	0.000*	0.952	0.645	0.246	0.692	0.501	2.235	9.203	100.0
0.3	R_+^2	cons.	0.4	0.6	0.0	0.0	524	0.804	0.715	0.948	0.557	-0.001	0.611	0.001	4.944	-0.916	100.0
0.3	R_+^2	cons.	0.4	0.6	0.3	0.3	477	0.802	0.597	0.943	0.071	0.054	0.612	0.248	0.694	11.621	100.0
0.3	R_+^2	cons.	0.4	0.6	0.6	0.6	335	0.763	0.000*	0.946	0.276	0.220	0.616	0.444	2.145	11.482	100.0
0.3	R_+^2	cons.	0.6	0.4	0.0	0.0	524	0.801	0.562	0.946	0.315	-0.002	0.611	0.000	-3.729	6.003	100.0
0.3	R_+^2	cons.	0.6	0.4	0.3	0.3	477	0.800	0.507	0.943	0.086	0.053	0.612	0.247	0.703	11.551	100.0
0.3	R_+^2	cons.	0.6	0.4	0.6	0.6	335	0.776	0.001*	0.952	0.645	0.221	0.613	0.444	2.144	11.471	100.0
0.3	R_+^2	cons.	0.6	0.6	0.0	0.0	489	0.810	0.912	0.953	0.476	-0.001	0.533	0.002	1.217	10.691	100.0
0.3	R_+^2	cons.	0.6	0.6	0.3	0.3	445	0.795	0.268	0.943	0.086	0.049	0.533	0.215	0.634	17.117	100.0
0.3	R_+^2	cons.	0.6	0.6	0.6	0.6	313	0.752	0.000*	0.946	0.315	0.190	0.537	0.388	2.014	17.237	100.0
0.3	R_+^2	sharp	0.4	0.4	0.3	0.3	498	0.785	0.020*	0.953	0.530	0.062	0.689	0.276	0.769	9.095	100.0
0.3	R_+^2	sharp	0.4	0.4	0.6	0.6	339	0.737	0.000*	0.944	0.154	0.246	0.692	0.500	2.211	9.112	100.0
0.3	R_+^2	sharp	0.4	0.6	0.3	0.3	468	0.794	0.225	0.946	0.315	0.055	0.613	0.248	0.704	11.369	100.0
0.3	R_+^2	sharp	0.4	0.6	0.6	0.6	320	0.748	0.000*	0.951	0.834	0.217	0.614	0.444	2.109	11.505	100.0
0.3	R_+^2	sharp	0.6	0.4	0.3	0.3	468	0.784	0.018*	0.948	0.615	0.055	0.613	0.246	0.689	11.465	100.0
0.3	R_+^2	sharp	0.6	0.4	0.6	0.6	320	0.741	0.000*	0.948	0.675	0.219	0.615	0.446	2.124	11.590	100.0
0.3	R_+^2	sharp	0.6	0.6	0.3	0.3	438	0.797	0.331	0.948	0.615	0.048	0.534	0.215	0.611	17.458	100.0
0.3	R_+^2	sharp	0.6	0.6	0.6	0.6	301	0.761	0.000*	0.943	0.094	0.190	0.538	0.390	1.998	17.151	100.0
0.3	R_-^2	cons.	0.4	0.4	0.0	0.0	559	0.934	1.000	0.942	0.040*	0.001	-0.423	0.002	-0.946	-2.095	100.0
0.3	R_-^2	cons.	0.4	0.4	0.3	0.3	508	0.913	1.000	0.943	0.086	-0.038	-0.422	-0.169	0.162	1.654	100.0
0.3	R_-^2	cons.	0.4	0.6	0.0	0.0	524	0.908	1.000	0.943	0.094	0.001	-0.353	-0.002	-8.467	-1.572	100.0
0.3	R_-^2	cons.	0.4	0.6	0.3	0.3	477	0.912	1.000	0.945	0.241	-0.031	-0.355	-0.144	0.137	1.250	100.0
0.3	R_-^2	cons.	0.6	0.4	0.0	0.0	524	0.908	1.000	0.944	0.132	0.001	-0.354	-0.002	0.797	-10.757	100.0
0.3	R_-^2	cons.	0.6	0.4	0.3	0.3	477	0.884	1.000	0.949	0.737	-0.031	-0.354	-0.143	0.109	1.207	100.0
0.3	R_-^2	cons.	0.6	0.6	0.0	0.0	489	0.866	1.000	0.943	0.094	-0.000	-0.287	-0.002	-0.128	-6.869	100.0
0.3	R_-^2	cons.	0.6	0.6	0.3	0.3	445	0.882	1.000	0.943	0.086	-0.026	-0.286	-0.116	0.096	0.833	100.0
0.3	R_-^2	sharp	0.4	0.4	0.3	0.3	498	0.904	1.000	0.948	0.615	-0.038	-0.424	-0.170	0.131	1.680	100.0
0.3	R_-^2	sharp	0.4	0.6	0.3	0.3	468	0.892	1.000	0.944	0.132	-0.033	-0.356	-0.142	0.104	1.213	100.0
0.3	R_-^2	sharp	0.6	0.4	0.3	0.3	468	0.888	1.000	0.940	0.013*	-0.034	-0.356	-0.141	0.122	1.189	100.0
0.3	R_-^2	sharp	0.6	0.6	0.3	0.3	438	0.873	1.000	0.950	1.000	-0.026	-0.287	-0.116	0.099	0.853	100.0
0.5	R_+^2	cons.	0.4	0.4	0.0	0.0	201	0.794	0.212	0.942	0.049*	0.001	0.699	-0.002	0.519	21.733	100.0
0.5	R_+^2	cons.	0.4	0.4	0.3	0.3	183	0.813	0.969	0.949	0.801	0.063	0.701	0.280	0.773	9.111	100.0
0.5	R_+^2	cons.	0.4	0.4	0.6	0.6	129	0.763	0.000*	0.933	0.000*	0.247	0.709	0.510	2.225	9.086	100.0
0.5	R_+^2	cons.	0.4	0.6	0.0	0.0	189	0.811	0.943	0.950	0.967	-0.002	0.620	0.004	1.709	4.232	100.0
0.5	R_+^2	cons.	0.4	0.6	0.3	0.3	172	0.816	0.986	0.943	0.071	0.054	0.625	0.246	0.672	11.658	100.0
0.5	R_+^2	cons.	0.4	0.6	0.6	0.6	121	0.782	0.009*	0.940	0.017*	0.219	0.630	0.451	2.113	11.461	100.0
0.5	R_+^2	cons.	0.6	0.4	0.0	0.0	189	0.809	0.887	0.950	1.000	-0.002	0.620	0.004	2.438	-4.508	100.0
0.5	R_+^2	cons.	0.6	0.4	0.3	0.3	172	0.804	0.730	0.953	0.530	0.055	0.627	0.248	0.693	11.340	100.0
0.5	R_+^2	cons.	0.6	0.4	0.6	0.6	121	0.771	0.000*	0.941	0.021*	0.221	0.630	0.452	2.116	11.516	100.0
0.5	R_+^2	cons.	0.6	0.6	0.0	0.0	176	0.808	0.858	0.945	0.209	0.003	0.544	0.002	-2.094	1.804	100.0
0.5	R_+^2	cons.	0.6	0.6	0.3	0.3	160	0.808	0.869	0.947	0.503	0.051	0.545	0.217	0.633	17.563	100.0
0.5	R_+^2	cons.	0.6	0.6	0.6	0.6	113	0.765	0.000*	0.938	0.004*	0.192	0.552	0.396	2.034	16.602	100.0
0.5	R_+^2	sharp	0.4	0.4	0.3	0.3	180	0.781	0.005*	0.945	0.180	0.064	0.701	0.279	0.783	8.988	100.0

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Additional simulation results for design II when working assumption A1(b) is violated: response is highly correlated with $(Y_1^{(d)} - \mu_1^{(d)})^2$

δ	Response	Formula	r_{-1}	r_1	ρ	ρ_{size}	n	$1-\hat{\beta}$	p value	Coverage	p value	$\text{Cor}(R, Y_0^2)$	$\text{Cor}(R, Y_1^2)$	$\text{Cor}(R, Y_0 Y_1)$	$\text{Cov}(Y_0, Y_2)$	$\text{Cov}(Y_1, Y_2)$	% Valid
0.5	R_+^2	sharp	0.4	0.4	0.6	0.6	122	0.759	0.000*	0.933	0.000*	0.246	0.709	0.508	2.186	9.166	100.0
0.5	R_+^2	sharp	0.4	0.6	0.3	0.3	169	0.798	0.417	0.948	0.615	0.054	0.622	0.246	0.695	11.589	100.0
0.5	R_+^2	sharp	0.4	0.6	0.6	0.6	115	0.752	0.000*	0.942	0.059	0.218	0.636	0.455	2.106	11.540	100.0
0.5	R_+^2	sharp	0.6	0.4	0.3	0.3	169	0.801	0.544	0.948	0.557	0.055	0.624	0.246	0.694	11.057	100.0
0.5	R_+^2	sharp	0.6	0.4	0.6	0.6	115	0.763	0.000*	0.938	0.003*	0.219	0.636	0.455	2.109	11.361	100.0
0.5	R_+^2	sharp	0.6	0.6	0.3	0.3	158	0.799	0.453	0.941	0.021*	0.048	0.545	0.217	0.617	17.189	100.0
0.5	R_+^2	sharp	0.6	0.6	0.6	0.6	109	0.752	0.000*	0.941	0.026*	0.195	0.552	0.395	1.985	16.967	100.0
0.5	R_-^2	cons.	0.4	0.4	0.0	0.0	201	0.915	1.000	0.934	0.000*	-0.001	-0.428	-0.003	0.350	-0.242	99.9
0.5	R_-^2	cons.	0.4	0.4	0.3	0.3	183	0.901	1.000	0.941	0.026*	-0.040	-0.428	-0.175	0.162	1.630	100.0
0.5	R_-^2	cons.	0.4	0.6	0.0	0.0	189	0.894	1.000	0.952	0.675	-0.001	-0.358	-0.003	-0.783	-2.904	99.9
0.5	R_-^2	cons.	0.4	0.6	0.3	0.3	172	0.888	1.000	0.940	0.013*	-0.031	-0.363	-0.142	0.121	1.249	100.0
0.5	R_-^2	cons.	0.6	0.4	0.0	0.0	189	0.895	1.000	0.949	0.867	-0.000	-0.357	-0.004	1.472	-0.443	100.0
0.5	R_-^2	cons.	0.6	0.4	0.3	0.3	172	0.887	1.000	0.942	0.059	-0.031	-0.364	-0.142	0.120	1.196	99.9
0.5	R_-^2	cons.	0.6	0.6	0.0	0.0	176	0.849	1.000	0.947	0.402	-0.002	-0.292	-0.004	-1.504	0.477	100.0
0.5	R_-^2	cons.	0.6	0.6	0.3	0.3	160	0.873	1.000	0.942	0.049*	-0.027	-0.292	-0.117	0.069	0.826	100.0
0.5	R_-^2	sharp	0.4	0.4	0.3	0.3	180	0.899	1.000	0.940	0.011*	-0.040	-0.430	-0.171	0.150	1.676	100.0
0.5	R_-^2	sharp	0.4	0.6	0.3	0.3	169	0.887	1.000	0.940	0.011*	-0.036	-0.360	-0.142	0.112	1.180	99.9
0.5	R_-^2	sharp	0.6	0.4	0.3	0.3	169	0.873	1.000	0.942	0.059	-0.035	-0.359	-0.141	0.118	1.205	99.9
0.5	R_-^2	sharp	0.6	0.6	0.3	0.3	158	0.863	1.000	0.945	0.241	-0.028	-0.292	-0.116	0.087	0.857	100.0

Table S12: Additional simulation results for design II when working assumption A1(c) is violated.

δ	Response	Formula	r_{-1}	r_1	ρ	ρ_{size}	n	$1-\hat{\beta}$	p value	Coverage	p value	Cor(R, Y_0^2)	Cor(R, Y_1^2)	Cor(R, Y_0Y_1)	Cov(Y_0, Y_2)	Cov(Y_1, Y_2)	% Valid
0.3	$R_{\perp\!\!\!\perp}$	cons.	0.4	0.4	0.3	0.3	508	0.798	0.382	0.949	0.801	0.001	-0.002	-0.001	2.491	2.468	100.0
0.3	$R_{\perp\!\!\!\perp}$	cons.	0.4	0.4	0.6	0.6	358	0.788	0.058	0.947	0.451	0.002	0.001	0.002	0.500	0.493	100.0
0.3	$R_{\perp\!\!\!\perp}$	cons.	0.4	0.4	0.8	0.8	201	0.792	0.132	0.941	0.026*	0.002	-0.002	-0.001	0.164	0.162	100.0
0.3	$R_{\perp\!\!\!\perp}$	cons.	0.4	0.6	0.3	0.3	477	0.786	0.033*	0.942	0.049*	0.002	-0.001	-0.002	2.086	2.085	100.0
0.3	$R_{\perp\!\!\!\perp}$	cons.	0.4	0.6	0.6	0.6	335	0.780	0.004*	0.953	0.530	0.001	-0.001	0.001	0.698	0.696	100.0
0.3	$R_{\perp\!\!\!\perp}$	cons.	0.4	0.6	0.8	0.8	189	0.784	0.016*	0.939	0.007*	-0.002	-0.000	-0.001	0.210	0.210	100.0
0.3	$R_{\perp\!\!\!\perp}$	cons.	0.6	0.4	0.3	0.3	477	0.779	0.003*	0.946	0.315	0.001	0.001	-0.001	2.114	2.080	100.0
0.3	$R_{\perp\!\!\!\perp}$	cons.	0.6	0.4	0.6	0.6	335	0.763	0.000*	0.944	0.154	-0.000	-0.003	-0.000	0.696	0.690	100.0
0.3	$R_{\perp\!\!\!\perp}$	cons.	0.6	0.4	0.8	0.8	189	0.763	0.000*	0.947	0.451	0.002	0.002	0.002	0.226	0.225	100.0
0.3	$R_{\perp\!\!\!\perp}$	cons.	0.6	0.6	0.3	0.3	445	0.780	0.004*	0.943	0.094	-0.002	-0.003	-0.001	1.708	1.633	100.0
0.3	$R_{\perp\!\!\!\perp}$	cons.	0.6	0.6	0.6	0.6	313	0.770	0.000*	0.942	0.049*	0.002	0.002	0.002	0.986	0.993	100.0
0.3	$R_{\perp\!\!\!\perp}$	cons.	0.6	0.6	0.8	0.8	176	0.776	0.001*	0.936	0.001*	0.006	0.004	0.005	0.282	0.280	100.0
0.3	$R_{\perp\!\!\!\perp}$	sharp	0.4	0.4	0.3	0.3	498	0.784	0.016*	0.952	0.645	0.002	-0.002	-0.001	2.472	2.502	100.0
0.3	$R_{\perp\!\!\!\perp}$	sharp	0.4	0.4	0.6	0.6	339	0.761	0.000*	0.948	0.557	-0.002	-0.001	-0.001	0.477	0.481	100.0
0.3	$R_{\perp\!\!\!\perp}$	sharp	0.4	0.4	0.8	0.8	187	0.773	0.000*	0.945	0.209	0.002	-0.000	0.001	0.167	0.167	100.0
0.3	$R_{\perp\!\!\!\perp}$	sharp	0.4	0.6	0.3	0.3	468	0.770	0.000*	0.942	0.049*	-0.001	-0.001	-0.002	2.093	2.137	100.0
0.3	$R_{\perp\!\!\!\perp}$	sharp	0.4	0.6	0.6	0.6	320	0.761	0.000*	0.943	0.071	-0.001	-0.002	-0.003	0.689	0.684	100.0
0.3	$R_{\perp\!\!\!\perp}$	sharp	0.4	0.6	0.8	0.8	176	0.762	0.000*	0.948	0.615	0.003	0.004	0.004	0.222	0.221	100.0
0.3	$R_{\perp\!\!\!\perp}$	sharp	0.6	0.4	0.3	0.3	468	0.785	0.022*	0.945	0.241	-0.001	0.000	0.001	2.083	2.097	100.0
0.3	$R_{\perp\!\!\!\perp}$	sharp	0.6	0.4	0.6	0.6	320	0.756	0.000*	0.937	0.002*	-0.001	0.002	0.001	0.691	0.698	100.0
0.3	$R_{\perp\!\!\!\perp}$	sharp	0.6	0.4	0.8	0.8	176	0.754	0.000*	0.954	0.379	0.002	0.001	0.001	0.218	0.216	100.0
0.3	$R_{\perp\!\!\!\perp}$	sharp	0.6	0.6	0.3	0.3	438	0.780	0.003*	0.937	0.002*	-0.001	-0.001	-0.001	1.704	1.681	100.0
0.3	$R_{\perp\!\!\!\perp}$	sharp	0.6	0.6	0.6	0.6	301	0.747	0.000*	0.946	0.276	0.001	0.001	-0.000	0.959	0.973	100.0
0.3	$R_{\perp\!\!\!\perp}$	sharp	0.6	0.6	0.8	0.8	166	0.744	0.000*	0.939	0.007*	-0.003	0.003	-0.002	0.275	0.273	100.0
0.5	$R_{\perp\!\!\!\perp}$	cons.	0.4	0.4	0.3	0.3	183	0.796	0.315	0.947	0.451	0.001	0.002	-0.001	2.457	2.436	100.0
0.5	$R_{\perp\!\!\!\perp}$	cons.	0.4	0.4	0.6	0.6	129	0.799	0.453	0.939	0.009*	-0.006	-0.002	-0.005	0.469	0.471	100.0
0.5	$R_{\perp\!\!\!\perp}$	cons.	0.4	0.4	0.8	0.8	73	0.795	0.253	0.940	0.012*	-0.003	-0.004	-0.004	0.159	0.166	100.0
0.5	$R_{\perp\!\!\!\perp}$	cons.	0.4	0.6	0.3	0.3	172	0.799	0.435	0.940	0.013*	-0.001	0.001	0.002	2.021	2.088	100.0
0.5	$R_{\perp\!\!\!\perp}$	cons.	0.4	0.6	0.6	0.6	121	0.778	0.002*	0.947	0.451	-0.001	-0.000	0.002	0.678	0.683	100.0
0.5	$R_{\perp\!\!\!\perp}$	cons.	0.4	0.6	0.8	0.8	68	0.792	0.138	0.929	0.000*	0.005	-0.004	-0.004	0.237	0.234	99.9
0.5	$R_{\perp\!\!\!\perp}$	cons.	0.6	0.4	0.3	0.3	172	0.786	0.027*	0.948	0.675	0.001	0.001	-0.001	2.111	2.066	100.0
0.5	$R_{\perp\!\!\!\perp}$	cons.	0.6	0.4	0.6	0.6	121	0.780	0.003*	0.946	0.356	0.004	-0.002	0.002	0.704	0.693	100.0
0.5	$R_{\perp\!\!\!\perp}$	cons.	0.6	0.4	0.8	0.8	68	0.783	0.012*	0.935	0.000*	-0.007	-0.005	-0.005	0.211	0.212	99.9
0.5	$R_{\perp\!\!\!\perp}$	cons.	0.6	0.6	0.3	0.3	160	0.802	0.632	0.934	0.000*	0.003	-0.002	-0.003	1.675	1.615	100.0
0.5	$R_{\perp\!\!\!\perp}$	cons.	0.6	0.6	0.6	0.6	113	0.770	0.000*	0.941	0.021*	0.004	0.002	0.003	1.003	0.989	100.0
0.5	$R_{\perp\!\!\!\perp}$	cons.	0.6	0.6	0.8	0.8	64	0.789	0.074	0.928	0.000*	0.002	0.005	0.002	0.325	0.323	99.6
0.5	$R_{\perp\!\!\!\perp}$	sharp	0.4	0.4	0.3	0.3	180	0.778	0.001*	0.938	0.003*	-0.003	-0.001	0.003	2.524	2.534	100.0
0.5	$R_{\perp\!\!\!\perp}$	sharp	0.4	0.4	0.6	0.6	122	0.792	0.132	0.943	0.071	0.001	0.003	0.002	0.492	0.497	100.0
0.5	$R_{\perp\!\!\!\perp}$	sharp	0.4	0.4	0.8	0.8	67	0.761	0.000*	0.928	0.000*	0.002	0.001	0.003	0.163	0.161	100.0
0.5	$R_{\perp\!\!\!\perp}$	sharp	0.4	0.6	0.3	0.3	169	0.790	0.090	0.953	0.426	-0.002	-0.002	-0.001	2.120	2.070	100.0
0.5	$R_{\perp\!\!\!\perp}$	sharp	0.4	0.6	0.6	0.6	115	0.746	0.000*	0.941	0.021*	-0.001	-0.002	-0.002	0.686	0.681	100.0
0.5	$R_{\perp\!\!\!\perp}$	sharp	0.4	0.6	0.8	0.8	64	0.762	0.000*	0.928	0.000*	0.002	0.003	0.003	0.246	0.246	99.7
0.5	$R_{\perp\!\!\!\perp}$	sharp	0.6	0.4	0.3	0.3	169	0.792	0.132	0.941	0.026*	0.002	0.002	-0.004	2.142	2.104	100.0
0.5	$R_{\perp\!\!\!\perp}$	sharp	0.6	0.4	0.6	0.6	115	0.762	0.000*	0.937	0.001*	-0.004	-0.002	-0.002	0.695	0.700	100.0
0.5	$R_{\perp\!\!\!\perp}$	sharp	0.6	0.4	0.8	0.8	64	0.762	0.000*	0.930	0.000*	0.001	0.002	0.001	0.233	0.240	99.8
0.5	$R_{\perp\!\!\!\perp}$	sharp	0.6	0.6	0.3	0.3	158	0.792	0.142	0.940	0.013*	-0.004	0.003	-0.005	1.637	1.660	100.0
0.5	$R_{\perp\!\!\!\perp}$	sharp	0.6	0.6	0.6	0.6	109	0.767	0.000*	0.945	0.209	0.005	-0.003	-0.004	0.950	0.950	100.0

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Additional simulation results for design II when working assumption A1(c) is violated.

δ	Response	Formula	r_{-1}	r_1	ρ	ρ_{size}	n	$1-\hat{\beta}$	p value	Coverage	p value	$\text{Cor}(R, Y_0^2)$	$\text{Cor}(R, Y_1^2)$	$\text{Cor}(R, Y_0 Y_1)$	$\text{Cov}(Y_0, Y_2)$	$\text{Cov}(Y_1, Y_2)$	% Valid
0.5	$R_{\perp\!\!\!\perp}$	sharp	0.6	0.6	0.8	0.8	60	0.766	0.000*	0.938	0.004*	0.005	0.003	0.003	0.364	0.358	99.3

Table S13: Additional simulation results for design II when working assumption A2 is violated: the true within-person correlation structure is AR(1) with correlation ρ

δ	Response	Formula	r_{-1}	r_1	ρ	ρ_{size}	n	$1-\hat{\beta}$	p value	Coverage	p value	$\text{Cor}(R, Y_0^2)$	$\text{Cor}(R, Y_1^2)$	$\text{Cor}(R, Y_0Y_1)$	$\text{Cov}(Y_0, Y_2)$	$\text{Cov}(Y_1, Y_2)$	% Valid
0.3	R_+	cons.	0.4	0.4	0.3	0.3	537	0.795	0.253	0.951	0.900	0.007	0.079	0.031	-0.090	-0.101	100.0
0.3	R_+	cons.	0.4	0.4	0.6	0.6	438	0.811	0.943	0.943	0.094	0.029	0.077	0.057	-0.108	-0.102	100.0
0.3	R_+	cons.	0.4	0.4	0.8	0.8	282	0.806	0.787	0.949	0.801	0.050	0.078	0.070	-0.100	-0.103	100.0
0.3	R_+	cons.	0.4	0.6	0.3	0.3	505	0.816	0.989	0.957	0.079	0.001	0.010	0.005	-0.015	-0.008	100.0
0.3	R_+	cons.	0.4	0.6	0.6	0.6	416	0.803	0.650	0.953	0.476	0.003	0.008	0.007	-0.010	-0.010	100.0
0.3	R_+	cons.	0.4	0.6	0.8	0.8	269	0.830	1.000	0.958	0.036*	0.006	0.011	0.008	-0.008	-0.008	100.0
0.3	R_+	cons.	0.6	0.4	0.3	0.3	505	0.807	0.837	0.950	0.967	0.002	0.010	0.005	-0.013	-0.017	100.0
0.3	R_+	cons.	0.6	0.4	0.6	0.6	416	0.817	0.991	0.950	0.967	0.006	0.009	0.007	0.008	-0.006	100.0
0.3	R_+	cons.	0.6	0.4	0.8	0.8	269	0.844	1.000	0.938	0.003*	0.009	0.013	0.012	-0.008	-0.009	100.0
0.3	R_+	cons.	0.6	0.6	0.3	0.3	473	0.804	0.699	0.944	0.132	-0.007	-0.060	-0.024	0.113	0.084	100.0
0.3	R_+	cons.	0.6	0.6	0.6	0.6	393	0.824	1.000	0.946	0.315	-0.022	-0.061	-0.045	0.077	0.080	100.0
0.3	R_+	cons.	0.6	0.6	0.8	0.8	257	0.842	1.000	0.942	0.059	-0.039	-0.060	-0.053	0.082	0.080	100.0
0.3	R_-	cons.	0.4	0.4	0.3	0.3	537	0.795	0.239	0.952	0.706	0.008	0.081	0.032	-0.114	-0.100	100.0
0.3	R_-	cons.	0.4	0.4	0.6	0.6	438	0.793	0.186	0.950	0.967	0.028	0.078	0.056	-0.101	-0.104	100.0
0.3	R_-	cons.	0.4	0.4	0.8	0.8	282	0.807	0.825	0.946	0.315	0.051	0.079	0.070	-0.107	-0.101	100.0
0.3	R_-	cons.	0.4	0.6	0.3	0.3	505	0.814	0.972	0.957	0.079	0.001	0.010	0.004	0.002	-0.004	100.0
0.3	R_-	cons.	0.4	0.6	0.6	0.6	416	0.809	0.896	0.944	0.132	0.005	0.010	0.007	-0.014	-0.012	100.0
0.3	R_-	cons.	0.4	0.6	0.8	0.8	269	0.825	1.000	0.948	0.615	0.010	0.011	0.011	-0.006	-0.009	100.0
0.3	R_-	cons.	0.6	0.4	0.3	0.3	505	0.795	0.268	0.949	0.867	0.001	0.010	0.003	-0.017	-0.010	100.0
0.3	R_-	cons.	0.6	0.4	0.6	0.6	416	0.791	0.114	0.951	0.834	0.004	0.010	0.008	-0.006	-0.011	100.0
0.3	R_-	cons.	0.6	0.6	0.3	0.3	473	0.819	0.997	0.945	0.209	-0.006	-0.061	-0.026	0.091	0.076	100.0
0.3	R_-	cons.	0.6	0.6	0.6	0.6	393	0.818	0.994	0.955	0.258	-0.022	-0.062	-0.046	0.085	0.084	100.0
0.3	$R_{\perp\!\!\!\perp}$	cons.	0.4	0.4	0.3	0.3	537	0.799	0.435	0.947	0.503	0.001	0.001	0.003	0.006	0.007	100.0
0.3	$R_{\perp\!\!\!\perp}$	cons.	0.4	0.4	0.6	0.6	438	0.812	0.957	0.952	0.706	-0.001	-0.001	0.001	0.002	-0.001	100.0
0.3	$R_{\perp\!\!\!\perp}$	cons.	0.4	0.4	0.8	0.8	282	0.814	0.972	0.950	0.967	-0.002	-0.002	-0.002	-0.003	-0.001	100.0
0.3	$R_{\perp\!\!\!\perp}$	cons.	0.4	0.6	0.3	0.3	505	0.804	0.699	0.950	0.967	0.001	0.001	0.002	-0.007	0.004	100.0
0.3	$R_{\perp\!\!\!\perp}$	cons.	0.4	0.6	0.6	0.6	416	0.789	0.076	0.945	0.180	-0.003	-0.002	-0.002	-0.000	0.003	100.0
0.3	$R_{\perp\!\!\!\perp}$	cons.	0.4	0.6	0.8	0.8	269	0.822	0.999	0.943	0.071	-0.000	0.001	0.001	0.001	0.001	100.0
0.3	$R_{\perp\!\!\!\perp}$	cons.	0.6	0.4	0.3	0.3	505	0.803	0.666	0.955	0.224	-0.001	-0.001	-0.002	-0.023	-0.008	100.0
0.3	$R_{\perp\!\!\!\perp}$	cons.	0.6	0.4	0.6	0.6	416	0.810	0.925	0.951	0.769	0.003	0.002	0.002	0.008	-0.003	100.0
0.3	$R_{\perp\!\!\!\perp}$	cons.	0.6	0.4	0.8	0.8	269	0.821	0.998	0.952	0.706	0.000	-0.001	-0.001	0.001	0.000	100.0
0.3	$R_{\perp\!\!\!\perp}$	cons.	0.6	0.6	0.3	0.3	473	0.806	0.813	0.951	0.900	0.001	-0.001	-0.001	0.032	-0.010	100.0
0.3	$R_{\perp\!\!\!\perp}$	cons.	0.6	0.6	0.6	0.6	393	0.798	0.399	0.954	0.295	0.000	-0.002	0.001	0.004	-0.003	100.0
0.3	$R_{\perp\!\!\!\perp}$	cons.	0.6	0.6	0.8	0.8	257	0.808	0.858	0.940	0.012*	-0.002	0.002	-0.001	0.003	0.002	100.0
0.5	R_+	cons.	0.4	0.4	0.3	0.3	194	0.803	0.666	0.940	0.013*	0.006	0.079	0.033	-0.070	-0.086	100.0
0.5	R_+	cons.	0.4	0.4	0.6	0.6	158	0.815	0.982	0.944	0.111	0.026	0.077	0.056	-0.103	-0.101	100.0
0.5	R_+	cons.	0.4	0.4	0.8	0.8	102	0.804	0.730	0.944	0.154	0.053	0.081	0.074	-0.096	-0.097	100.0
0.5	R_+	cons.	0.4	0.6	0.3	0.3	182	0.802	0.632	0.940	0.013*	-0.002	0.012	0.005	0.034	-0.004	100.0
0.5	R_+	cons.	0.4	0.6	0.6	0.6	150	0.800	0.525	0.945	0.180	0.006	0.015	0.012	-0.010	-0.004	100.0
0.5	R_+	cons.	0.6	0.4	0.3	0.3	182	0.801	0.544	0.943	0.071	0.004	0.010	0.006	-0.012	-0.025	100.0
0.5	R_+	cons.	0.6	0.4	0.6	0.6	150	0.813	0.965	0.943	0.094	0.003	0.009	0.007	-0.021	-0.008	100.0
0.5	R_+	cons.	0.6	0.4	0.8	0.8	97	0.819	0.996	0.948	0.675	0.006	0.012	0.008	-0.014	-0.009	100.0
0.5	R_+	cons.	0.6	0.6	0.3	0.3	171	0.812	0.953	0.940	0.013*	-0.006	-0.059	-0.022	0.142	0.079	100.0
0.5	R_+	cons.	0.6	0.6	0.6	0.6	142	0.817	0.991	0.946	0.315	-0.023	-0.057	-0.043	0.085	0.075	100.0
0.5	R_+	sharp	0.4	0.4	0.3	0.3	180	0.762	0.000*	0.940	0.013*	0.006	0.080	0.035	-0.068	-0.093	100.0
0.5	R_+	sharp	0.4	0.4	0.6	0.6	122	0.680	0.000*	0.939	0.006*	0.027	0.078	0.057	-0.105	-0.097	100.0

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Additional simulation results for design II when working assumption A2 is violated: the true within-person correlation structure is AR(1) with correlation ρ

δ	Response	Formula	r_{-1}	r_1	ρ	ρ_{size}	n	$1-\hat{\beta}$	p value	Coverage	p value	Cor(R, Y_0^2)	Cor(R, Y_1^2)	Cor$(R, Y_0 Y_1)$	Cov(Y_0, Y_2)	Cov(Y_1, Y_2)	% Valid
0.5	R_+	sharp	0.4	0.4	0.8	0.8	67	0.611	0.000*	0.930	0.000*	0.053	0.084	0.073	-0.116	-0.107	100.0
0.5	R_+	sharp	0.4	0.6	0.3	0.3	169	0.765	0.000*	0.936	0.001*	0.003	0.009	0.003	0.004	0.019	100.0
0.5	R_+	sharp	0.4	0.6	0.6	0.6	115	0.679	0.000*	0.936	0.001*	0.006	0.011	0.008	-0.003	-0.005	100.0
0.5	R_+	sharp	0.6	0.4	0.3	0.3	169	0.764	0.000*	0.935	0.000*	-0.005	0.012	0.004	-0.015	-0.021	100.0
0.5	R_+	sharp	0.6	0.4	0.6	0.6	115	0.690	0.000*	0.934	0.000*	0.007	0.014	0.010	-0.024	-0.015	100.0
0.5	R_+	sharp	0.6	0.4	0.8	0.8	64	0.629	0.000*	0.939	0.010*	0.011	0.015	0.015	0.007	0.008	99.7
0.5	R_+	sharp	0.6	0.6	0.3	0.3	158	0.776	0.001*	0.947	0.451	-0.008	-0.062	-0.026	0.053	0.060	100.0
0.5	R_+	sharp	0.6	0.6	0.6	0.6	109	0.699	0.000*	0.943	0.086	-0.019	-0.059	-0.041	0.093	0.080	100.0
0.5	R_-	cons.	0.4	0.4	0.3	0.3	194	0.802	0.597	0.944	0.132	0.009	0.078	0.033	-0.141	-0.117	100.0
0.5	R_-	cons.	0.4	0.4	0.6	0.6	158	0.792	0.132	0.948	0.615	0.029	0.082	0.059	-0.098	-0.103	100.0
0.5	R_-	cons.	0.4	0.4	0.8	0.8	102	0.801	0.544	0.933	0.000*	0.054	0.079	0.072	-0.084	-0.096	100.0
0.5	R_-	cons.	0.4	0.6	0.3	0.3	182	0.810	0.925	0.946	0.315	0.002	0.012	0.004	0.054	-0.016	100.0
0.5	R_-	cons.	0.4	0.6	0.6	0.6	150	0.808	0.878	0.943	0.086	0.003	0.012	0.008	-0.006	-0.015	100.0
0.5	R_-	cons.	0.6	0.4	0.3	0.3	182	0.807	0.837	0.941	0.033*	0.002	0.013	0.003	-0.060	0.003	100.0
0.5	R_-	cons.	0.6	0.4	0.6	0.6	150	0.802	0.632	0.942	0.059	0.004	0.014	0.008	-0.002	-0.003	100.0
0.5	R_-	cons.	0.6	0.4	0.8	0.8	97	0.818	0.993	0.941	0.021*	0.010	0.013	0.012	0.008	-0.002	100.0
0.5	R_-	cons.	0.6	0.6	0.3	0.3	171	0.807	0.837	0.941	0.033*	-0.009	-0.064	-0.026	0.054	0.074	100.0
0.5	R_-	cons.	0.6	0.6	0.6	0.6	142	0.818	0.995	0.950	0.967	-0.021	-0.063	-0.046	0.074	0.081	100.0
0.5	R_-	cons.	0.6	0.6	0.8	0.8	93	0.809	0.892	0.944	0.111	-0.041	-0.065	-0.057	0.078	0.084	99.9
0.5	R_-	sharp	0.4	0.4	0.3	0.3	180	0.767	0.000*	0.938	0.004*	0.010	0.082	0.033	-0.192	-0.106	100.0
0.5	R_-	sharp	0.4	0.4	0.6	0.6	122	0.674	0.000*	0.934	0.000*	0.032	0.080	0.058	-0.116	-0.105	100.0
0.5	R_-	sharp	0.4	0.4	0.8	0.8	67	0.593	0.000*	0.933	0.000*	0.053	0.083	0.072	-0.091	-0.099	100.0
0.5	R_-	sharp	0.4	0.6	0.3	0.3	169	0.769	0.000*	0.942	0.059	0.007	0.008	0.003	-0.032	0.008	100.0
0.5	R_-	sharp	0.4	0.6	0.6	0.6	115	0.690	0.000*	0.941	0.021*	0.006	0.012	0.008	-0.018	-0.017	100.0
0.5	R_-	sharp	0.6	0.4	0.3	0.3	169	0.774	0.000*	0.940	0.017*	0.002	0.010	0.005	0.081	0.005	100.0
0.5	R_-	sharp	0.6	0.4	0.6	0.6	115	0.671	0.000*	0.935	0.000*	0.006	0.009	0.007	-0.013	-0.010	100.0
0.5	R_-	sharp	0.6	0.4	0.8	0.8	64	0.615	0.000*	0.933	0.000*	0.005	0.008	0.006	0.012	0.014	99.8
0.5	R_-	sharp	0.6	0.6	0.3	0.3	158	0.767	0.000*	0.940	0.017*	-0.005	-0.059	-0.023	0.162	0.097	100.0
0.5	R_-	sharp	0.6	0.6	0.6	0.6	109	0.689	0.000*	0.934	0.000*	-0.025	-0.060	-0.046	0.084	0.085	100.0
0.5	R_-	sharp	0.6	0.6	0.8	0.8	60	0.629	0.000*	0.939	0.009*	-0.039	-0.062	-0.055	0.160	0.161	99.3
0.5	$R_{\perp\!\!\!\perp}$	cons.	0.4	0.4	0.3	0.3	194	0.802	0.597	0.945	0.180	-0.003	0.001	-0.001	0.001	-0.018	100.0
0.5	$R_{\perp\!\!\!\perp}$	cons.	0.4	0.4	0.6	0.6	158	0.806	0.813	0.944	0.154	0.000	0.002	0.001	0.019	0.005	100.0
0.5	$R_{\perp\!\!\!\perp}$	cons.	0.4	0.4	0.8	0.8	102	0.800	0.507	0.942	0.040*	0.003	0.001	0.001	-0.001	-0.001	100.0
0.5	$R_{\perp\!\!\!\perp}$	cons.	0.4	0.6	0.3	0.3	182	0.804	0.699	0.944	0.132	0.002	0.003	0.001	-0.035	0.003	100.0
0.5	$R_{\perp\!\!\!\perp}$	cons.	0.4	0.6	0.6	0.6	150	0.796	0.299	0.938	0.003*	-0.003	0.002	-0.001	0.005	0.004	100.0
0.5	$R_{\perp\!\!\!\perp}$	cons.	0.4	0.6	0.8	0.8	97	0.813	0.961	0.943	0.094	-0.000	-0.002	-0.001	0.001	0.001	100.0
0.5	$R_{\perp\!\!\!\perp}$	cons.	0.6	0.4	0.3	0.3	182	0.805	0.745	0.943	0.086	-0.002	-0.003	-0.001	0.034	-0.028	100.0
0.5	$R_{\perp\!\!\!\perp}$	cons.	0.6	0.4	0.6	0.6	150	0.790	0.090	0.943	0.071	0.003	-0.002	0.001	-0.000	-0.002	100.0
0.5	$R_{\perp\!\!\!\perp}$	cons.	0.6	0.4	0.8	0.8	97	0.802	0.615	0.939	0.007*	0.000	0.002	0.001	0.008	0.008	100.0
0.5	$R_{\perp\!\!\!\perp}$	cons.	0.6	0.6	0.3	0.3	171	0.809	0.904	0.941	0.026*	-0.002	-0.001	0.002	0.000	0.005	100.0
0.5	$R_{\perp\!\!\!\perp}$	cons.	0.6	0.6	0.6	0.6	142	0.818	0.993	0.951	0.900	-0.001	-0.002	-0.004	-0.009	0.003	100.0
0.5	$R_{\perp\!\!\!\perp}$	cons.	0.6	0.6	0.8	0.8	93	0.813	0.961	0.946	0.357	-0.003	-0.001	-0.001	-0.001	0.004	100.0
0.5	$R_{\perp\!\!\!\perp}$	sharp	0.4	0.4	0.3	0.3	180	0.760	0.000*	0.940	0.012*	-0.001	-0.003	-0.003	0.001	-0.023	100.0
0.5	$R_{\perp\!\!\!\perp}$	sharp	0.4	0.4	0.6	0.6	122	0.682	0.000*	0.947	0.402	-0.002	0.004	-0.003	-0.001	-0.002	100.0
0.5	$R_{\perp\!\!\!\perp}$	sharp	0.4	0.4	0.8	0.8	67	0.604	0.000*	0.933	0.000*	0.001	0.003	0.003	0.012	0.013	100.0

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Additional simulation results for design II when working assumption A2 is violated: the true within-person correlation structure is AR(1) with correlation ρ

δ	Response	Formula	r_{-1}	r_1	ρ	ρ_{size}	n	$1-\hat{\beta}$	p value	Coverage	p value	$\text{Cor}(R, Y_0^2)$	$\text{Cor}(R, Y_1^2)$	$\text{Cor}(R, Y_0 Y_1)$	$\text{Cov}(Y_0, Y_2)$	$\text{Cov}(Y_1, Y_2)$	% Valid
0.5	$R_{\perp\!\!\!\perp}$	sharp	0.4	0.6	0.3	0.3	169	0.758	0.000*	0.938	0.003*	0.005	-0.003	-0.002	-0.040	-0.009	100.0
0.5	$R_{\perp\!\!\!\perp}$	sharp	0.4	0.6	0.6	0.6	115	0.684	0.000*	0.950	0.933	0.004	-0.001	0.004	-0.005	0.001	100.0
0.5	$R_{\perp\!\!\!\perp}$	sharp	0.4	0.6	0.8	0.8	64	0.622	0.000*	0.937	0.001*	-0.001	0.004	0.003	0.010	0.011	99.7
0.5	$R_{\perp\!\!\!\perp}$	sharp	0.6	0.4	0.3	0.3	169	0.749	0.000*	0.939	0.009*	-0.005	0.003	0.002	0.013	0.008	100.0
0.5	$R_{\perp\!\!\!\perp}$	sharp	0.6	0.4	0.6	0.6	115	0.677	0.000*	0.942	0.049*	-0.004	0.001	-0.004	-0.011	-0.006	100.0
0.5	$R_{\perp\!\!\!\perp}$	sharp	0.6	0.4	0.8	0.8	64	0.621	0.000*	0.934	0.000*	0.001	-0.004	-0.002	0.004	0.004	99.9
0.5	$R_{\perp\!\!\!\perp}$	sharp	0.6	0.6	0.3	0.3	158	0.774	0.000*	0.934	0.000*	-0.000	-0.001	0.002	0.004	-0.003	100.0
0.5	$R_{\perp\!\!\!\perp}$	sharp	0.6	0.6	0.6	0.6	109	0.671	0.000*	0.943	0.094	0.001	0.007	0.005	0.012	0.014	100.0
0.5	$R_{\perp\!\!\!\perp}$	sharp	0.6	0.6	0.8	0.8	60	0.638	0.000*	0.936	0.001*	0.003	0.003	0.002	0.048	0.049	99.3

S7.3 Additional Simulations for Design III

Table S14: Additional simulation results for design III when working assumptions A1 and A2 are satisfied

δ	Response	Formula	r_{-1}	r_1	ρ	ρ_{size}	n	$1-\hat{\beta}$	p value	Coverage	p value	$\text{Cor}(R, Y_0^2)$	$\text{Cor}(R, Y_1^2)$	$\text{Cor}(R, Y_0 Y_1)$	$\text{Cov}(Y_0, Y_2)$	$\text{Cov}(Y_1, Y_2)$	% Valid
0.3	R_+	cons.	0.4	0.4	0.0	0.0	454	0.813	0.965	0.946	0.357	0.001	0.080	-0.000	2.210	-0.640	100.0
0.3	R_+	cons.	0.4	0.4	0.3	0.3	413	0.809	0.887	0.961	0.006*	0.008	0.078	0.031	-0.017	-0.119	100.0
0.3	R_+	cons.	0.4	0.4	0.6	0.6	291	0.811	0.943	0.952	0.586	0.030	0.080	0.058	-0.049	-0.096	100.0
0.3	R_+	cons.	0.4	0.4	0.8	0.8	164	0.812	0.957	0.936	0.000*	0.050	0.077	0.069	-0.077	-0.107	100.0
0.3	R_+	cons.	0.4	0.6	0.0	0.0	419	0.806	0.800	0.949	0.737	0.001	0.009	0.002	1.799	1.982	100.0
0.3	R_+	cons.	0.4	0.6	0.3	0.3	381	0.809	0.887	0.955	0.224	0.000	0.010	0.003	-0.006	0.018	100.0
0.3	R_+	cons.	0.4	0.6	0.6	0.6	268	0.825	1.000	0.951	0.769	0.004	0.009	0.008	0.010	0.023	100.0
0.3	R_+	cons.	0.6	0.4	0.0	0.0	454	0.820	0.998	0.946	0.276	0.001	0.014	0.001	2.618	-1.712	100.0
0.3	R_+	cons.	0.6	0.4	0.3	0.3	413	0.810	0.919	0.952	0.706	0.001	0.009	0.004	-0.007	-0.056	100.0
0.3	R_+	cons.	0.6	0.4	0.6	0.6	291	0.808	0.869	0.953	0.476	0.006	0.010	0.008	-0.016	-0.032	100.0
0.3	R_+	cons.	0.6	0.4	0.8	0.8	164	0.817	0.990	0.936	0.001*	0.006	0.008	0.008	-0.030	-0.044	100.0
0.3	R_+	cons.	0.6	0.6	0.0	0.0	419	0.814	0.977	0.951	0.834	-0.001	-0.060	0.003	-2.764	2.229	100.0
0.3	R_+	cons.	0.6	0.6	0.3	0.3	381	0.812	0.948	0.957	0.102	-0.005	-0.059	-0.024	0.009	0.085	100.0
0.3	R_+	cons.	0.6	0.6	0.6	0.6	268	0.817	0.990	0.949	0.737	-0.022	-0.059	-0.043	0.037	0.081	100.0
0.3	R_+	sharp	0.4	0.4	0.3	0.3	408	0.794	0.212	0.949	0.737	0.008	0.080	0.031	-0.018	-0.097	100.0
0.3	R_+	sharp	0.4	0.4	0.6	0.6	281	0.787	0.036*	0.948	0.615	0.029	0.079	0.057	-0.050	-0.107	100.0
0.3	R_+	sharp	0.4	0.4	0.8	0.8	156	0.797	0.331	0.947	0.451	0.051	0.079	0.070	-0.072	-0.100	100.0
0.3	R_+	sharp	0.4	0.6	0.3	0.3	378	0.811	0.943	0.952	0.586	0.004	0.012	0.006	0.031	0.023	100.0
0.3	R_+	sharp	0.4	0.6	0.6	0.6	262	0.810	0.919	0.945	0.180	0.004	0.012	0.008	0.012	0.029	100.0
0.3	R_+	sharp	0.6	0.4	0.3	0.3	408	0.788	0.058	0.944	0.111	0.002	0.010	0.003	-0.001	-0.030	100.0
0.3	R_+	sharp	0.6	0.4	0.6	0.6	281	0.796	0.299	0.950	1.000	0.004	0.009	0.006	-0.020	-0.046	100.0
0.3	R_+	sharp	0.6	0.4	0.8	0.8	156	0.798	0.399	0.945	0.241	0.005	0.009	0.008	-0.026	-0.034	100.0
0.3	R_+	sharp	0.6	0.6	0.3	0.3	378	0.801	0.544	0.946	0.357	-0.006	-0.060	-0.022	0.042	0.090	100.0
0.3	R_+	sharp	0.6	0.6	0.6	0.6	262	0.802	0.597	0.948	0.615	-0.021	-0.059	-0.043	0.043	0.087	100.0
0.3	R_-	cons.	0.4	0.4	0.0	0.0	454	0.806	0.800	0.950	0.967	-0.001	0.077	0.001	2.356	-1.065	100.0
0.3	R_-	cons.	0.4	0.4	0.3	0.3	413	0.814	0.975	0.953	0.530	0.009	0.080	0.032	-0.023	-0.093	100.0
0.3	R_-	cons.	0.4	0.4	0.6	0.6	291	0.818	0.995	0.948	0.615	0.027	0.079	0.057	-0.053	-0.097	100.0
0.3	R_-	cons.	0.4	0.4	0.8	0.8	164	0.839	1.000	0.937	0.002*	0.050	0.081	0.070	-0.079	-0.101	100.0
0.3	R_-	cons.	0.4	0.6	0.0	0.0	419	0.812	0.948	0.948	0.675	-0.000	0.009	-0.002	1.312	-1.817	100.0
0.3	R_-	cons.	0.4	0.6	0.3	0.3	381	0.808	0.858	0.954	0.335	0.003	0.009	0.005	0.002	0.026	100.0
0.3	R_-	cons.	0.4	0.6	0.6	0.6	268	0.850	1.000	0.947	0.402	0.005	0.010	0.008	0.015	0.023	100.0
0.3	R_-	cons.	0.6	0.4	0.0	0.0	454	0.808	0.878	0.941	0.033*	-0.001	0.010	0.001	1.073	0.555	100.0
0.3	R_-	cons.	0.6	0.4	0.3	0.3	413	0.821	0.998	0.955	0.258	0.002	0.013	0.005	-0.021	-0.037	100.0
0.3	R_-	cons.	0.6	0.4	0.6	0.6	291	0.827	1.000	0.952	0.586	0.003	0.011	0.007	-0.021	-0.038	100.0
0.3	R_-	cons.	0.6	0.4	0.8	0.8	164	0.847	1.000	0.941	0.026*	0.008	0.015	0.013	-0.034	-0.038	100.0
0.3	R_-	cons.	0.6	0.6	0.0	0.0	419	0.817	0.990	0.951	0.769	-0.000	-0.059	-0.002	0.981	-2.575	100.0
0.3	R_-	cons.	0.6	0.6	0.3	0.3	381	0.808	0.878	0.961	0.006*	-0.004	-0.061	-0.024	0.017	0.084	100.0
0.3	R_-	cons.	0.6	0.6	0.6	0.6	268	0.844	1.000	0.948	0.615	-0.021	-0.060	-0.042	0.044	0.082	100.0
0.3	R_-	sharp	0.4	0.4	0.3	0.3	408	0.808	0.858	0.942	0.049*	0.010	0.078	0.032	-0.025	-0.107	100.0
0.3	R_-	sharp	0.4	0.4	0.6	0.6	281	0.822	0.999	0.947	0.451	0.030	0.078	0.057	-0.052	-0.104	100.0
0.3	R_-	sharp	0.4	0.4	0.8	0.8	156	0.834	1.000	0.940	0.017*	0.051	0.078	0.070	-0.070	-0.099	100.0
0.3	R_-	sharp	0.4	0.6	0.3	0.3	378	0.806	0.813	0.947	0.451	0.001	0.008	0.002	-0.002	0.012	100.0
0.3	R_-	sharp	0.4	0.6	0.6	0.6	262	0.825	1.000	0.946	0.357	0.003	0.009	0.008	0.004	0.022	100.0
0.3	R_-	sharp	0.6	0.4	0.3	0.3	408	0.794	0.225	0.939	0.007*	0.004	0.011	0.005	-0.007	-0.042	100.0

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Additional simulation results for design III when working assumptions A1 and A2 are satisfied

δ	Response	Formula	r_{-1}	r_1	ρ	ρ_{size}	n	$1-\hat{\beta}$	p value	Coverage	p value	Cor(R, Y_0^2)	Cor(R, Y_1^2)	Cor(R, Y_0Y_1)	Cov(Y_0, Y_2)	Cov(Y_1, Y_2)	% Valid
0.3	R_-	sharp	0.6	0.4	0.6	0.6	281	0.822	0.999	0.942	0.049*	0.005	0.011	0.008	-0.022	-0.042	100.0
0.3	R_-	sharp	0.6	0.4	0.8	0.8	156	0.837	1.000	0.944	0.111	0.007	0.010	0.009	-0.026	-0.038	100.0
0.3	R_-	sharp	0.6	0.6	0.3	0.3	378	0.803	0.650	0.948	0.557	-0.006	-0.062	-0.025	0.008	0.073	100.0
0.3	R_-	sharp	0.6	0.6	0.6	0.6	262	0.842	1.000	0.947	0.503	-0.022	-0.060	-0.043	0.034	0.079	100.0
0.3	$R_{\perp\!\!\!\perp}$	cons.	0.4	0.4	0.0	0.0	454	0.806	0.813	0.947	0.402	-0.000	0.002	-0.001	1.721	-5.101	100.0
0.3	$R_{\perp\!\!\!\perp}$	cons.	0.4	0.4	0.3	0.3	413	0.815	0.982	0.952	0.586	-0.002	0.001	-0.003	0.007	-0.001	100.0
0.3	$R_{\perp\!\!\!\perp}$	cons.	0.4	0.4	0.6	0.6	291	0.821	0.998	0.954	0.379	-0.002	-0.000	-0.001	-0.000	0.001	100.0
0.3	$R_{\perp\!\!\!\perp}$	cons.	0.4	0.4	0.8	0.8	164	0.824	1.000	0.945	0.241	-0.004	-0.002	-0.004	-0.000	-0.001	100.0
0.3	$R_{\perp\!\!\!\perp}$	cons.	0.4	0.6	0.0	0.0	419	0.800	0.507	0.953	0.426	-0.000	0.001	-0.001	-1.257	-1.328	100.0
0.3	$R_{\perp\!\!\!\perp}$	cons.	0.4	0.6	0.3	0.3	381	0.820	0.998	0.952	0.586	0.003	0.001	0.002	-0.010	-0.009	100.0
0.3	$R_{\perp\!\!\!\perp}$	cons.	0.4	0.6	0.6	0.6	268	0.825	1.000	0.946	0.315	0.003	0.001	0.003	-0.000	0.005	100.0
0.3	$R_{\perp\!\!\!\perp}$	cons.	0.4	0.6	0.8	0.8	151	0.816	0.989	0.937	0.002*	-0.002	0.001	-0.002	-0.005	0.001	100.0
0.3	$R_{\perp\!\!\!\perp}$	cons.	0.6	0.4	0.0	0.0	454	0.813	0.961	0.952	0.706	0.002	0.001	-0.001	2.936	-1.925	100.0
0.3	$R_{\perp\!\!\!\perp}$	cons.	0.6	0.4	0.3	0.3	413	0.819	0.997	0.947	0.451	0.002	-0.001	0.001	0.006	0.004	100.0
0.3	$R_{\perp\!\!\!\perp}$	cons.	0.6	0.4	0.6	0.6	291	0.813	0.965	0.961	0.005*	0.002	0.003	0.003	0.001	0.005	100.0
0.3	$R_{\perp\!\!\!\perp}$	cons.	0.6	0.4	0.8	0.8	164	0.831	1.000	0.950	0.967	0.002	0.004	0.004	0.004	0.003	100.0
0.3	$R_{\perp\!\!\!\perp}$	cons.	0.6	0.6	0.0	0.0	419	0.813	0.965	0.946	0.315	-0.000	0.002	0.001	1.959	0.065	100.0
0.3	$R_{\perp\!\!\!\perp}$	cons.	0.6	0.6	0.3	0.3	381	0.823	0.999	0.956	0.142	0.001	0.002	0.002	-0.010	-0.001	100.0
0.3	$R_{\perp\!\!\!\perp}$	cons.	0.6	0.6	0.6	0.6	268	0.823	0.999	0.949	0.801	-0.002	-0.003	-0.001	-0.004	-0.001	100.0
0.3	$R_{\perp\!\!\!\perp}$	cons.	0.6	0.6	0.8	0.8	151	0.820	0.998	0.940	0.012*	0.002	0.003	0.003	0.001	0.004	100.0
0.3	$R_{\perp\!\!\!\perp}$	sharp	0.4	0.4	0.3	0.3	408	0.808	0.869	0.943	0.086	-0.001	0.001	0.001	0.009	-0.004	100.0
0.3	$R_{\perp\!\!\!\perp}$	sharp	0.4	0.4	0.6	0.6	281	0.813	0.969	0.945	0.180	-0.001	-0.000	-0.001	0.003	0.001	100.0
0.3	$R_{\perp\!\!\!\perp}$	sharp	0.4	0.4	0.8	0.8	156	0.812	0.953	0.943	0.094	0.001	0.003	0.002	0.006	0.006	100.0
0.3	$R_{\perp\!\!\!\perp}$	sharp	0.4	0.6	0.3	0.3	378	0.808	0.858	0.951	0.834	-0.001	0.002	0.002	-0.017	-0.007	100.0
0.3	$R_{\perp\!\!\!\perp}$	sharp	0.4	0.6	0.6	0.6	262	0.805	0.774	0.939	0.009*	-0.002	0.001	-0.001	0.003	0.005	100.0
0.3	$R_{\perp\!\!\!\perp}$	sharp	0.4	0.6	0.8	0.8	146	0.806	0.787	0.943	0.094	-0.002	0.003	0.004	0.001	0.006	100.0
0.3	$R_{\perp\!\!\!\perp}$	sharp	0.6	0.4	0.3	0.3	408	0.803	0.650	0.938	0.003*	0.002	-0.002	0.002	0.013	0.001	100.0
0.3	$R_{\perp\!\!\!\perp}$	sharp	0.6	0.4	0.6	0.6	281	0.816	0.987	0.945	0.241	0.001	0.000	0.001	0.003	0.002	100.0
0.3	$R_{\perp\!\!\!\perp}$	sharp	0.6	0.4	0.8	0.8	156	0.811	0.932	0.940	0.017*	0.002	0.003	0.002	0.003	0.002	100.0
0.3	$R_{\perp\!\!\!\perp}$	sharp	0.6	0.6	0.3	0.3	378	0.809	0.904	0.946	0.276	-0.001	-0.003	-0.002	-0.015	-0.018	100.0
0.3	$R_{\perp\!\!\!\perp}$	sharp	0.6	0.6	0.6	0.6	262	0.814	0.975	0.948	0.557	0.004	0.002	0.004	0.010	0.010	100.0
0.3	$R_{\perp\!\!\!\perp}$	sharp	0.6	0.6	0.8	0.8	146	0.799	0.471	0.947	0.402	-0.002	-0.001	-0.001	0.002	0.004	100.0
0.5	R_+	cons.	0.4	0.4	0.0	0.0	164	0.804	0.730	0.946	0.276	-0.002	0.080	-0.008	-0.498	-0.430	100.0
0.5	R_+	cons.	0.4	0.4	0.3	0.3	149	0.815	0.982	0.938	0.004*	0.007	0.081	0.032	-0.024	-0.101	100.0
0.5	R_+	cons.	0.4	0.4	0.6	0.6	105	0.810	0.919	0.935	0.000*	0.027	0.080	0.056	-0.059	-0.107	100.0
0.5	R_+	cons.	0.4	0.6	0.0	0.0	151	0.812	0.953	0.945	0.180	0.003	0.009	-0.003	-1.934	-1.201	100.0
0.5	R_+	cons.	0.4	0.6	0.3	0.3	138	0.808	0.869	0.944	0.154	-0.003	0.010	0.006	0.003	0.017	100.0
0.5	R_+	cons.	0.6	0.4	0.0	0.0	164	0.808	0.858	0.944	0.111	-0.001	0.013	-0.008	-0.468	-1.209	100.0
0.5	R_+	cons.	0.6	0.4	0.3	0.3	149	0.814	0.977	0.946	0.276	-0.002	0.012	0.003	-0.000	-0.029	100.0
0.5	R_+	cons.	0.6	0.4	0.6	0.6	105	0.807	0.848	0.933	0.000*	0.003	0.011	0.009	-0.024	-0.043	100.0
0.5	R_+	cons.	0.6	0.6	0.0	0.0	151	0.809	0.896	0.944	0.111	0.004	-0.062	-0.004	-1.109	-0.921	100.0
0.5	R_+	cons.	0.6	0.6	0.3	0.3	138	0.809	0.887	0.946	0.276	-0.006	-0.061	-0.025	0.040	0.099	100.0
0.5	R_+	cons.	0.6	0.6	0.6	0.6	97	0.812	0.953	0.943	0.086	-0.024	-0.065	-0.044	0.054	0.089	100.0
0.5	R_+	sharp	0.4	0.4	0.3	0.3	147	0.810	0.919	0.951	0.900	0.009	0.078	0.030	-0.028	-0.103	100.0
0.5	R_+	sharp	0.4	0.4	0.6	0.6	102	0.798	0.399	0.942	0.040*	0.030	0.078	0.057	-0.051	-0.102	100.0
0.5	R_+	sharp	0.4	0.6	0.3	0.3	136	0.806	0.787	0.945	0.209	0.002	0.011	0.004	-0.003	0.002	100.0
0.5	R_+	sharp	0.6	0.4	0.3	0.3	147	0.809	0.887	0.946	0.276	0.003	0.008	0.002	-0.006	-0.037	100.0

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Additional simulation results for design III when working assumptions A1 and A2 are satisfied

δ	Response	Formula	r_{-1}	r_1	ρ	ρ_{size}	n	$1-\hat{\beta}$	p value	Coverage	p value	Cor(R, Y_0^2)	Cor(R, Y_1^2)	Cor$(R, Y_0 Y_1)$	Cov(Y_0, Y_2)	Cov(Y_1, Y_2)	% Valid
0.5	R_+	sharp	0.6	0.4	0.6	0.6	102	0.801	0.544	0.941	0.033*	0.008	0.011	0.010	-0.018	-0.035	100.0
0.5	R_+	sharp	0.6	0.6	0.3	0.3	136	0.794	0.225	0.935	0.000*	-0.007	-0.060	-0.024	0.007	0.070	100.0
0.5	R_+	sharp	0.6	0.6	0.6	0.6	95	0.791	0.105	0.940	0.012*	-0.022	-0.062	-0.047	0.037	0.082	100.0
0.5	R_-	cons.	0.4	0.4	0.0	0.0	164	0.795	0.239	0.939	0.007*	0.001	0.078	0.008	-2.086	-0.610	100.0
0.5	R_-	cons.	0.4	0.4	0.3	0.3	149	0.827	1.000	0.945	0.209	0.010	0.083	0.033	-0.010	-0.102	100.0
0.5	R_-	cons.	0.4	0.4	0.6	0.6	105	0.812	0.957	0.939	0.006*	0.029	0.082	0.058	-0.057	-0.109	100.0
0.5	R_-	cons.	0.4	0.4	0.8	0.8	59	0.823	0.999	0.935	0.000*	0.052	0.081	0.072	-0.092	-0.111	100.0
0.5	R_-	cons.	0.4	0.6	0.0	0.0	151	0.809	0.904	0.939	0.009*	-0.002	0.012	0.003	-1.177	-1.673	100.0
0.5	R_-	cons.	0.4	0.6	0.3	0.3	138	0.822	0.999	0.943	0.086	0.001	0.011	0.004	0.008	0.021	100.0
0.5	R_-	cons.	0.4	0.6	0.6	0.6	97	0.829	1.000	0.940	0.017*	0.004	0.013	0.007	0.008	0.016	100.0
0.5	R_-	cons.	0.6	0.4	0.0	0.0	164	0.800	0.489	0.944	0.154	0.001	0.012	0.007	-3.166	-8.880	100.0
0.5	R_-	cons.	0.6	0.4	0.3	0.3	149	0.820	0.997	0.949	0.801	0.002	0.011	0.007	-0.008	-0.041	100.0
0.5	R_-	cons.	0.6	0.4	0.6	0.6	105	0.814	0.977	0.942	0.040*	0.007	0.011	0.010	-0.023	-0.041	100.0
0.5	R_-	cons.	0.6	0.4	0.8	0.8	59	0.832	1.000	0.928	0.000*	0.009	0.012	0.012	-0.044	-0.049	100.0
0.5	R_-	cons.	0.6	0.6	0.0	0.0	151	0.803	0.666	0.939	0.007*	-0.002	-0.060	0.002	-0.477	-3.372	100.0
0.5	R_-	cons.	0.6	0.6	0.3	0.3	138	0.814	0.977	0.945	0.241	-0.004	-0.062	-0.025	0.028	0.087	100.0
0.5	R_-	cons.	0.6	0.6	0.6	0.6	97	0.826	1.000	0.936	0.001*	-0.025	-0.060	-0.044	0.041	0.080	100.0
0.5	R_-	sharp	0.4	0.4	0.3	0.3	147	0.803	0.650	0.945	0.209	0.009	0.079	0.033	-0.024	-0.090	100.0
0.5	R_-	sharp	0.4	0.4	0.6	0.6	102	0.808	0.858	0.945	0.241	0.028	0.081	0.060	-0.052	-0.096	100.0
0.5	R_-	sharp	0.4	0.4	0.8	0.8	57	0.799	0.471	0.937	0.002*	0.049	0.083	0.073	-0.085	-0.101	100.0
0.5	R_-	sharp	0.4	0.6	0.3	0.3	136	0.817	0.992	0.939	0.009*	0.007	0.009	0.005	-0.009	0.033	100.0
0.5	R_-	sharp	0.4	0.6	0.6	0.6	95	0.828	1.000	0.944	0.154	0.008	0.013	0.013	0.019	0.031	100.0
0.5	R_-	sharp	0.6	0.4	0.3	0.3	147	0.805	0.774	0.939	0.009*	0.001	0.010	0.007	-0.020	-0.030	100.0
0.5	R_-	sharp	0.6	0.4	0.6	0.6	102	0.811	0.943	0.944	0.154	0.005	0.013	0.008	-0.015	-0.031	100.0
0.5	R_-	sharp	0.6	0.4	0.8	0.8	57	0.803	0.683	0.941	0.026*	0.005	0.013	0.013	-0.030	-0.030	100.0
0.5	R_-	sharp	0.6	0.6	0.3	0.3	136	0.804	0.715	0.937	0.001*	-0.006	-0.062	-0.024	0.002	0.092	100.0
0.5	R_-	sharp	0.6	0.6	0.6	0.6	95	0.816	0.985	0.944	0.154	-0.017	-0.059	-0.042	0.053	0.095	100.0
0.5	$R_{\perp\!\!\!\perp}$	cons.	0.4	0.4	0.0	0.0	164	0.808	0.878	0.949	0.737	-0.004	0.002	-0.001	0.412	-1.431	100.0
0.5	$R_{\perp\!\!\!\perp}$	cons.	0.4	0.4	0.3	0.3	149	0.822	0.999	0.941	0.033*	-0.005	0.003	0.002	-0.024	0.007	100.0
0.5	$R_{\perp\!\!\!\perp}$	cons.	0.4	0.4	0.6	0.6	105	0.811	0.938	0.938	0.004*	-0.006	-0.004	-0.003	-0.007	-0.005	100.0
0.5	$R_{\perp\!\!\!\perp}$	cons.	0.4	0.4	0.8	0.8	59	0.838	1.000	0.930	0.000*	0.005	0.003	0.004	0.008	0.004	100.0
0.5	$R_{\perp\!\!\!\perp}$	cons.	0.4	0.6	0.0	0.0	151	0.796	0.299	0.934	0.000*	-0.002	0.003	0.002	-1.105	1.039	100.0
0.5	$R_{\perp\!\!\!\perp}$	cons.	0.4	0.6	0.3	0.3	138	0.797	0.365	0.945	0.209	-0.003	0.004	0.005	-0.005	-0.007	100.0
0.5	$R_{\perp\!\!\!\perp}$	cons.	0.4	0.6	0.6	0.6	97	0.805	0.757	0.945	0.209	-0.001	-0.003	-0.002	0.005	0.007	100.0
0.5	$R_{\perp\!\!\!\perp}$	cons.	0.4	0.6	0.8	0.8	55	0.823	0.999	0.946	0.313	0.008	0.010	0.008	0.066	0.070	99.4
0.5	$R_{\perp\!\!\!\perp}$	cons.	0.6	0.4	0.0	0.0	164	0.809	0.896	0.951	0.769	0.002	-0.002	0.003	0.102	-0.048	100.0
0.5	$R_{\perp\!\!\!\perp}$	cons.	0.6	0.4	0.3	0.3	149	0.813	0.969	0.941	0.033*	-0.001	-0.003	-0.001	-0.012	0.009	100.0
0.5	$R_{\perp\!\!\!\perp}$	cons.	0.6	0.4	0.6	0.6	105	0.823	0.999	0.946	0.276	-0.004	0.001	-0.002	-0.014	-0.006	100.0
0.5	$R_{\perp\!\!\!\perp}$	cons.	0.6	0.4	0.8	0.8	59	0.835	1.000	0.934	0.000*	0.002	0.003	-0.002	-0.001	-0.003	100.0
0.5	$R_{\perp\!\!\!\perp}$	cons.	0.6	0.6	0.0	0.0	151	0.798	0.417	0.935	0.000*	0.002	0.003	0.003	-0.975	0.159	100.0
0.5	$R_{\perp\!\!\!\perp}$	cons.	0.6	0.6	0.3	0.3	138	0.812	0.957	0.945	0.209	0.003	0.005	0.005	0.012	-0.006	100.0
0.5	$R_{\perp\!\!\!\perp}$	cons.	0.6	0.6	0.6	0.6	97	0.803	0.663	0.938	0.003*	0.002	0.004	0.002	0.005	0.009	100.0
0.5	$R_{\perp\!\!\!\perp}$	cons.	0.6	0.6	0.8	0.8	55	0.826	1.000	0.940	0.012*	0.004	-0.002	0.001	0.056	0.053	99.4
0.5	$R_{\perp\!\!\!\perp}$	sharp	0.4	0.4	0.3	0.3	147	0.795	0.253	0.940	0.017*	-0.003	-0.003	-0.002	-0.024	-0.001	100.0
0.5	$R_{\perp\!\!\!\perp}$	sharp	0.4	0.4	0.6	0.6	102	0.817	0.991	0.947	0.503	0.003	0.002	0.001	0.006	0.006	100.0
0.5	$R_{\perp\!\!\!\perp}$	sharp	0.4	0.4	0.8	0.8	57	0.806	0.813	0.934	0.000*	-0.007	-0.005	-0.007	-0.007	-0.008	100.0
0.5	$R_{\perp\!\!\!\perp}$	sharp	0.4	0.6	0.3	0.3	136	0.795	0.239	0.947	0.503	0.003	0.002	-0.002	0.002	0.024	100.0

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Additional simulation results for design III when working assumptions A1 and A2 are satisfied

δ	Response	Formula	r_{-1}	r_1	ρ	ρ_{size}	n	$1-\hat{\beta}$	p value	Coverage	p value	$\text{Cor}(R, Y_0^2)$	$\text{Cor}(R, Y_1^2)$	$\text{Cor}(R, Y_0 Y_1)$	$\text{Cov}(Y_0, Y_2)$	$\text{Cov}(Y_1, Y_2)$	% Valid
0.5	$R_{\perp\perp}$	sharp	0.4	0.6	0.6	0.6	95	0.809	0.904	0.936	0.001*	-0.004	0.002	0.003	0.003	0.001	100.0
0.5	$R_{\perp\perp}$	sharp	0.4	0.6	0.8	0.8	53	0.815	0.983	0.924	0.000*	0.005	0.006	0.006	0.072	0.079	99.2
0.5	$R_{\perp\perp}$	sharp	0.6	0.4	0.3	0.3	147	0.807	0.825	0.945	0.180	-0.004	0.002	-0.002	-0.021	0.002	100.0
0.5	$R_{\perp\perp}$	sharp	0.6	0.4	0.6	0.6	102	0.812	0.953	0.946	0.276	0.001	0.002	0.002	0.014	0.008	100.0
0.5	$R_{\perp\perp}$	sharp	0.6	0.4	0.8	0.8	57	0.809	0.904	0.936	0.001*	-0.006	-0.004	-0.005	-0.004	-0.002	100.0
0.5	$R_{\perp\perp}$	sharp	0.6	0.6	0.3	0.3	136	0.802	0.615	0.947	0.503	0.004	0.005	0.005	0.021	0.034	100.0
0.5	$R_{\perp\perp}$	sharp	0.6	0.6	0.6	0.6	95	0.809	0.904	0.943	0.094	-0.005	-0.005	-0.004	-0.005	-0.011	100.0
0.5	$R_{\perp\perp}$	sharp	0.6	0.6	0.8	0.8	53	0.826	1.000	0.932	0.000*	0.001	0.008	0.003	0.062	0.077	99.2

Table S15: Additional simulation results for design III when working assumption A1(a) is violated: responders' end-of-study variance is 25% below the appropriate lower bound.

δ	Response	Formula	r_{-1}	r_1	ρ	ρ_{size}	n	$1-\hat{\beta}$	p value	Coverage	p value	$\text{Cor}(R, Y_0^2)$	$\text{Cor}(R, Y_1^2)$	$\text{Cor}(R, Y_0 Y_1)$	$\text{Cov}(Y_0, Y_2)$	$\text{Cov}(Y_1, Y_2)$	% Valid
0.3	R_+	cons.	0.4	0.4	0.0	0.0	454	0.782	0.008*	0.952	0.586	-0.001	0.077	0.001	1.930	-1.055	100.0
0.3	R_+	cons.	0.4	0.4	0.3	0.3	413	0.789	0.070	0.953	0.530	0.009	0.080	0.032	-0.023	-0.094	100.0
0.3	R_+	cons.	0.4	0.4	0.6	0.6	291	0.794	0.225	0.949	0.867	0.027	0.079	0.057	-0.053	-0.097	100.0
0.3	R_+	cons.	0.4	0.4	0.8	0.8	164	0.812	0.953	0.939	0.007*	0.050	0.081	0.070	-0.079	-0.101	100.0
0.3	R_+	cons.	0.4	0.6	0.0	0.0	419	0.778	0.002*	0.946	0.315	-0.000	0.009	-0.002	1.202	-1.522	100.0
0.3	R_+	cons.	0.4	0.6	0.3	0.3	381	0.773	0.000*	0.951	0.900	0.003	0.009	0.005	0.002	0.028	100.0
0.3	R_+	cons.	0.4	0.6	0.6	0.6	268	0.815	0.980	0.950	0.933	0.005	0.010	0.008	0.015	0.023	100.0
0.3	R_+	cons.	0.4	0.6	0.8	0.8	151	0.799	0.453	0.939	0.009*	0.008	0.013	0.010	0.010	0.017	100.0
0.3	R_+	cons.	0.6	0.4	0.0	0.0	454	0.782	0.008*	0.944	0.111	-0.001	0.010	0.001	1.048	0.369	100.0
0.3	R_+	cons.	0.6	0.4	0.3	0.3	413	0.790	0.090	0.954	0.379	0.002	0.013	0.005	-0.020	-0.038	100.0
0.3	R_+	cons.	0.6	0.4	0.6	0.6	291	0.806	0.787	0.957	0.102	0.003	0.011	0.007	-0.021	-0.038	100.0
0.3	R_+	cons.	0.6	0.4	0.8	0.8	164	0.815	0.982	0.943	0.086	0.008	0.015	0.013	-0.034	-0.038	100.0
0.3	R_+	cons.	0.6	0.6	0.0	0.0	419	0.781	0.005*	0.950	0.967	-0.000	-0.059	-0.002	1.003	-1.944	100.0
0.3	R_+	cons.	0.6	0.6	0.3	0.3	381	0.776	0.001*	0.959	0.024*	-0.004	-0.061	-0.024	0.017	0.086	100.0
0.3	R_+	cons.	0.6	0.6	0.6	0.6	268	0.807	0.825	0.948	0.557	-0.021	-0.060	-0.042	0.044	0.082	100.0
0.3	R_+	cons.	0.6	0.6	0.8	0.8	151	0.803	0.683	0.943	0.071	-0.037	-0.060	-0.052	0.054	0.076	100.0
0.3	R_+	sharp	0.4	0.4	0.3	0.3	408	0.787	0.044*	0.942	0.059	0.010	0.078	0.032	-0.025	-0.105	100.0
0.3	R_+	sharp	0.4	0.4	0.6	0.6	281	0.799	0.453	0.947	0.451	0.030	0.078	0.057	-0.051	-0.103	100.0
0.3	R_+	sharp	0.4	0.4	0.8	0.8	156	0.800	0.489	0.942	0.059	0.051	0.078	0.070	-0.071	-0.099	100.0
0.3	R_+	sharp	0.4	0.6	0.3	0.3	378	0.768	0.000*	0.950	1.000	0.001	0.008	0.002	-0.003	0.013	100.0
0.3	R_+	sharp	0.4	0.6	0.6	0.6	262	0.790	0.097	0.947	0.503	0.003	0.009	0.008	0.004	0.023	100.0
0.3	R_+	sharp	0.4	0.6	0.8	0.8	146	0.786	0.030*	0.939	0.009*	0.005	0.010	0.008	0.006	0.012	100.0
0.3	R_+	sharp	0.6	0.4	0.3	0.3	408	0.774	0.000*	0.938	0.003*	0.004	0.011	0.005	-0.008	-0.041	100.0
0.3	R_+	sharp	0.6	0.4	0.6	0.6	281	0.796	0.315	0.943	0.086	0.005	0.011	0.008	-0.021	-0.040	100.0
0.3	R_+	sharp	0.6	0.4	0.8	0.8	156	0.797	0.365	0.943	0.094	0.007	0.010	0.009	-0.027	-0.039	100.0
0.3	R_+	sharp	0.6	0.6	0.3	0.3	378	0.773	0.000*	0.948	0.615	-0.006	-0.062	-0.025	0.006	0.074	100.0
0.3	R_+	sharp	0.6	0.6	0.6	0.6	262	0.801	0.544	0.948	0.557	-0.022	-0.060	-0.043	0.033	0.079	100.0
0.3	R_+	sharp	0.6	0.6	0.8	0.8	146	0.783	0.013*	0.944	0.111	-0.039	-0.063	-0.055	0.054	0.076	100.0
0.3	R_-	cons.	0.4	0.4	0.0	0.0	454	0.790	0.083	0.949	0.737	0.001	0.080	-0.000	2.096	-0.763	100.0
0.3	R_-	cons.	0.4	0.4	0.3	0.3	413	0.792	0.132	0.961	0.006*	0.008	0.078	0.031	-0.017	-0.118	100.0
0.3	R_-	cons.	0.4	0.4	0.6	0.6	291	0.802	0.632	0.951	0.834	0.030	0.080	0.058	-0.049	-0.095	100.0
0.3	R_-	cons.	0.4	0.4	0.8	0.8	164	0.815	0.982	0.934	0.000*	0.050	0.077	0.069	-0.077	-0.107	100.0
0.3	R_-	cons.	0.4	0.6	0.0	0.0	419	0.772	0.000*	0.951	0.834	0.001	0.009	0.002	1.487	1.629	100.0
0.3	R_-	cons.	0.4	0.6	0.3	0.3	381	0.783	0.013*	0.955	0.194	0.000	0.010	0.003	-0.006	0.019	100.0
0.3	R_-	cons.	0.4	0.6	0.6	0.6	268	0.811	0.932	0.952	0.645	0.004	0.009	0.008	0.010	0.024	100.0
0.3	R_-	cons.	0.6	0.4	0.0	0.0	454	0.794	0.225	0.941	0.026*	0.001	0.014	0.001	0.848	-1.527	100.0
0.3	R_-	cons.	0.6	0.4	0.3	0.3	413	0.798	0.382	0.954	0.335	0.001	0.009	0.004	-0.007	-0.055	100.0
0.3	R_-	cons.	0.6	0.4	0.6	0.6	291	0.794	0.225	0.950	1.000	0.006	0.010	0.008	-0.016	-0.032	100.0
0.3	R_-	cons.	0.6	0.4	0.8	0.8	164	0.815	0.980	0.935	0.000*	0.006	0.008	0.008	-0.031	-0.044	100.0
0.3	R_-	cons.	0.6	0.6	0.0	0.0	419	0.775	0.000*	0.951	0.834	-0.001	-0.060	0.003	-2.053	1.758	100.0
0.3	R_-	cons.	0.6	0.6	0.3	0.3	381	0.783	0.011*	0.955	0.194	-0.005	-0.059	-0.024	0.009	0.086	100.0
0.3	R_-	cons.	0.6	0.6	0.6	0.6	268	0.791	0.105	0.946	0.357	-0.022	-0.059	-0.043	0.038	0.082	100.0
0.3	R_-	sharp	0.4	0.4	0.3	0.3	408	0.781	0.006*	0.948	0.675	0.008	0.080	0.031	-0.019	-0.098	100.0
0.3	R_-	sharp	0.4	0.4	0.6	0.6	281	0.778	0.001*	0.950	0.967	0.029	0.079	0.057	-0.050	-0.106	100.0
0.3	R_-	sharp	0.4	0.4	0.8	0.8	156	0.802	0.597	0.950	1.000	0.051	0.079	0.070	-0.072	-0.100	100.0
0.3	R_-	sharp	0.4	0.6	0.3	0.3	378	0.786	0.033*	0.949	0.801	0.004	0.012	0.006	0.031	0.027	100.0

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Additional simulation results for design III when working assumption A1(a) is violated: responders' end-of-study variance is 25% below the appropriate lower bound.

δ	Response	Formula	r_{-1}	r_1	ρ	ρ_{size}	n	$1-\hat{\beta}$	p value	Coverage	p value	$\text{Cor}(R, Y_0^2)$	$\text{Cor}(R, Y_1^2)$	$\text{Cor}(R, Y_0Y_1)$	$\text{Cov}(Y_0, Y_2)$	$\text{Cov}(Y_1, Y_2)$	% Valid
0.3	R_-	sharp	0.4	0.6	0.6	0.6	262	0.795	0.239	0.942	0.049*	0.004	0.012	0.008	0.010	0.027	100.0
0.3	R_-	sharp	0.6	0.4	0.3	0.3	408	0.769	0.000*	0.943	0.071	0.002	0.010	0.003	-0.003	-0.029	100.0
0.3	R_-	sharp	0.6	0.4	0.6	0.6	281	0.783	0.010*	0.950	1.000	0.004	0.009	0.006	-0.020	-0.045	100.0
0.3	R_-	sharp	0.6	0.4	0.8	0.8	156	0.799	0.453	0.942	0.049*	0.005	0.009	0.008	-0.025	-0.035	100.0
0.3	R_-	sharp	0.6	0.6	0.3	0.3	378	0.775	0.000*	0.947	0.402	-0.006	-0.060	-0.022	0.043	0.093	100.0
0.3	R_-	sharp	0.6	0.6	0.6	0.6	262	0.784	0.016*	0.950	1.000	-0.021	-0.059	-0.043	0.040	0.083	100.0
0.3	$R_{\perp\perp}$	cons.	0.4	0.4	0.0	0.0	454	0.787	0.036*	0.952	0.706	-0.000	0.002	-0.001	1.473	-3.830	100.0
0.3	$R_{\perp\perp}$	cons.	0.4	0.4	0.0	0.0	454	0.779	0.002*	0.944	0.154	-0.001	0.002	-0.002	-42.169	1.069	100.0
0.3	$R_{\perp\perp}$	cons.	0.4	0.4	0.3	0.3	413	0.795	0.239	0.950	1.000	-0.002	0.001	-0.003	0.005	-0.001	100.0
0.3	$R_{\perp\perp}$	cons.	0.4	0.4	0.3	0.3	413	0.793	0.186	0.941	0.021*	0.001	0.001	0.000	-0.235	-0.240	100.0
0.3	$R_{\perp\perp}$	cons.	0.4	0.4	0.6	0.6	291	0.803	0.683	0.952	0.645	-0.002	-0.000	-0.001	-0.000	0.001	100.0
0.3	$R_{\perp\perp}$	cons.	0.4	0.4	0.6	0.6	291	0.819	0.997	0.940	0.013*	-0.002	-0.003	-0.003	-0.139	-0.137	100.0
0.3	$R_{\perp\perp}$	cons.	0.4	0.4	0.8	0.8	164	0.818	0.994	0.944	0.132	-0.004	-0.002	-0.004	-0.001	-0.001	100.0
0.3	$R_{\perp\perp}$	cons.	0.4	0.4	0.8	0.8	164	0.810	0.925	0.947	0.503	0.006	0.002	0.004	-0.059	-0.059	100.0
0.3	$R_{\perp\perp}$	cons.	0.4	0.6	0.0	0.0	419	0.777	0.001*	0.952	0.706	-0.000	0.001	-0.001	-1.160	-1.204	100.0
0.3	$R_{\perp\perp}$	cons.	0.4	0.6	0.0	0.0	419	0.811	0.938	0.949	0.737	0.001	-0.001	0.001	-0.929	1.272	100.0
0.3	$R_{\perp\perp}$	cons.	0.4	0.6	0.3	0.3	381	0.787	0.044*	0.954	0.335	0.003	0.001	0.002	-0.008	-0.007	100.0
0.3	$R_{\perp\perp}$	cons.	0.4	0.6	0.3	0.3	381	0.808	0.878	0.946	0.357	0.001	-0.002	-0.001	-0.239	-0.249	100.0
0.3	$R_{\perp\perp}$	cons.	0.4	0.6	0.6	0.6	268	0.801	0.544	0.944	0.111	0.003	0.001	0.003	-0.000	0.005	100.0
0.3	$R_{\perp\perp}$	cons.	0.4	0.6	0.6	0.6	268	0.816	0.986	0.947	0.451	-0.000	-0.002	-0.001	-0.145	-0.145	100.0
0.3	$R_{\perp\perp}$	cons.	0.4	0.6	0.8	0.8	151	0.769	0.000*	0.938	0.003*	-0.002	0.001	-0.002	-0.006	0.000	100.0
0.3	$R_{\perp\perp}$	cons.	0.4	0.6	0.8	0.8	151	0.828	1.000	0.940	0.017*	-0.006	-0.006	-0.006	-0.128	-0.131	100.0
0.3	$R_{\perp\perp}$	cons.	0.6	0.4	0.0	0.0	454	0.782	0.009*	0.955	0.258	0.002	0.001	-0.001	2.242	-1.593	100.0
0.3	$R_{\perp\perp}$	cons.	0.6	0.4	0.0	0.0	454	0.724	0.000*	0.942	0.040*	-0.000	-0.002	-0.001	-0.608	1.201	100.0
0.3	$R_{\perp\perp}$	cons.	0.6	0.4	0.3	0.3	413	0.799	0.435	0.947	0.402	0.002	-0.001	0.001	0.006	0.003	100.0
0.3	$R_{\perp\perp}$	cons.	0.6	0.4	0.3	0.3	413	0.746	0.000*	0.948	0.557	0.002	0.002	0.001	-0.305	-0.310	100.0
0.3	$R_{\perp\perp}$	cons.	0.6	0.4	0.6	0.6	291	0.800	0.507	0.958	0.036*	0.002	0.003	0.003	0.001	0.004	100.0
0.3	$R_{\perp\perp}$	cons.	0.6	0.4	0.6	0.6	291	0.784	0.014*	0.953	0.530	-0.000	-0.002	-0.001	-0.181	-0.180	100.0
0.3	$R_{\perp\perp}$	cons.	0.6	0.4	0.8	0.8	164	0.813	0.965	0.946	0.357	0.002	0.004	0.004	0.004	0.004	100.0
0.3	$R_{\perp\perp}$	cons.	0.6	0.4	0.8	0.8	164	0.815	0.980	0.947	0.503	-0.002	-0.004	-0.002	-0.084	-0.083	100.0
0.3	$R_{\perp\perp}$	cons.	0.6	0.6	0.0	0.0	419	0.773	0.000*	0.949	0.801	-0.000	0.002	0.001	1.550	-0.423	100.0
0.3	$R_{\perp\perp}$	cons.	0.6	0.6	0.0	0.0	419	0.772	0.000*	0.946	0.357	0.000	0.001	-0.002	2.136	-0.795	100.0
0.3	$R_{\perp\perp}$	cons.	0.6	0.6	0.3	0.3	381	0.785	0.024*	0.956	0.121	0.001	0.002	0.002	-0.010	-0.001	100.0
0.3	$R_{\perp\perp}$	cons.	0.6	0.6	0.3	0.3	381	0.776	0.001*	0.951	0.769	-0.002	0.001	0.003	-0.319	-0.314	100.0
0.3	$R_{\perp\perp}$	cons.	0.6	0.6	0.6	0.6	268	0.801	0.580	0.948	0.615	-0.002	-0.003	-0.001	-0.004	0.001	100.0
0.3	$R_{\perp\perp}$	cons.	0.6	0.6	0.6	0.6	268	0.798	0.399	0.944	0.154	0.001	-0.002	0.001	-0.184	-0.186	100.0
0.3	$R_{\perp\perp}$	cons.	0.6	0.6	0.8	0.8	151	0.772	0.000*	0.942	0.059	0.002	0.003	0.003	-0.000	0.003	100.0
0.3	$R_{\perp\perp}$	cons.	0.6	0.6	0.8	0.8	151	0.806	0.813	0.945	0.241	-0.002	-0.002	-0.002	-0.166	-0.167	100.0
0.3	$R_{\perp\perp}$	sharp	0.4	0.4	0.3	0.3	408	0.782	0.007*	0.947	0.402	0.001	0.002	0.001	-0.239	-0.243	100.0
0.3	$R_{\perp\perp}$	sharp	0.4	0.4	0.3	0.3	408	0.785	0.020*	0.939	0.007*	-0.001	0.001	0.001	0.010	-0.001	100.0
0.3	$R_{\perp\perp}$	sharp	0.4	0.4	0.6	0.6	281	0.804	0.699	0.952	0.645	0.003	-0.000	0.002	-0.126	-0.133	100.0
0.3	$R_{\perp\perp}$	sharp	0.4	0.4	0.6	0.6	281	0.793	0.163	0.944	0.111	-0.001	-0.000	-0.001	0.002	0.001	100.0
0.3	$R_{\perp\perp}$	sharp	0.4	0.4	0.8	0.8	156	0.799	0.453	0.950	0.933	-0.002	-0.002	-0.002	-0.065	-0.065	100.0
0.3	$R_{\perp\perp}$	sharp	0.4	0.4	0.8	0.8	156	0.799	0.471	0.944	0.132	0.001	0.003	0.002	0.007	0.006	100.0
0.3	$R_{\perp\perp}$	sharp	0.4	0.6	0.3	0.3	378	0.808	0.878	0.952	0.645	0.002	-0.001	-0.001	-0.245	-0.249	100.0

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Additional simulation results for design III when working assumption A1(a) is violated: responders' end-of-study variance is 25% below the appropriate lower bound.

δ	Response	Formula	r_{-1}	r_1	ρ	ρ_{size}	n	$1-\hat{\beta}$	p value	Coverage	p value	$\text{Cor}(R, Y_0^2)$	$\text{Cor}(R, Y_1^2)$	$\text{Cor}(R, Y_0Y_1)$	$\text{Cov}(Y_0, Y_2)$	$\text{Cov}(Y_1, Y_2)$	% Valid
0.3	$R_{\perp\!\!\!\perp}$	sharp	0.4	0.6	0.3	0.3	378	0.777	0.001*	0.951	0.834	-0.001	0.002	0.002	-0.018	-0.007	100.0
0.3	$R_{\perp\!\!\!\perp}$	sharp	0.4	0.6	0.6	0.6	262	0.805	0.760	0.949	0.867	0.002	-0.002	0.001	-0.132	-0.140	100.0
0.3	$R_{\perp\!\!\!\perp}$	sharp	0.4	0.6	0.6	0.6	262	0.785	0.024*	0.942	0.049*	-0.002	0.001	-0.001	0.004	0.007	100.0
0.3	$R_{\perp\!\!\!\perp}$	sharp	0.4	0.6	0.8	0.8	146	0.807	0.837	0.948	0.557	-0.003	-0.001	-0.003	-0.124	-0.123	100.0
0.3	$R_{\perp\!\!\!\perp}$	sharp	0.4	0.6	0.8	0.8	146	0.758	0.000*	0.941	0.026*	-0.002	0.003	0.004	0.001	0.005	100.0
0.3	$R_{\perp\!\!\!\perp}$	sharp	0.6	0.4	0.3	0.3	408	0.743	0.000*	0.944	0.154	-0.003	0.001	0.001	-0.309	-0.309	100.0
0.3	$R_{\perp\!\!\!\perp}$	sharp	0.6	0.4	0.3	0.3	408	0.785	0.020*	0.939	0.009*	0.002	-0.002	0.002	0.014	0.003	100.0
0.3	$R_{\perp\!\!\!\perp}$	sharp	0.6	0.4	0.6	0.6	281	0.774	0.000*	0.943	0.094	0.001	0.001	0.001	-0.172	-0.175	100.0
0.3	$R_{\perp\!\!\!\perp}$	sharp	0.6	0.4	0.6	0.6	281	0.801	0.544	0.943	0.071	0.001	0.000	0.001	0.003	0.002	100.0
0.3	$R_{\perp\!\!\!\perp}$	sharp	0.6	0.4	0.8	0.8	156	0.786	0.030*	0.943	0.071	0.002	0.002	0.001	-0.092	-0.091	100.0
0.3	$R_{\perp\!\!\!\perp}$	sharp	0.6	0.4	0.8	0.8	156	0.795	0.239	0.940	0.012*	0.002	0.003	0.002	0.004	0.002	100.0
0.3	$R_{\perp\!\!\!\perp}$	sharp	0.6	0.6	0.3	0.3	378	0.774	0.000*	0.952	0.586	0.001	-0.000	0.000	-0.319	-0.313	100.0
0.3	$R_{\perp\!\!\!\perp}$	sharp	0.6	0.6	0.3	0.3	378	0.777	0.001*	0.948	0.615	-0.001	-0.003	-0.002	-0.017	-0.018	100.0
0.3	$R_{\perp\!\!\!\perp}$	sharp	0.6	0.6	0.6	0.6	262	0.786	0.030*	0.951	0.900	0.000	0.003	0.002	-0.178	-0.181	100.0
0.3	$R_{\perp\!\!\!\perp}$	sharp	0.6	0.6	0.6	0.6	262	0.797	0.365	0.944	0.132	0.004	0.002	0.004	0.011	0.011	100.0
0.3	$R_{\perp\!\!\!\perp}$	sharp	0.6	0.6	0.8	0.8	146	0.795	0.253	0.948	0.675	-0.002	-0.002	-0.002	-0.163	-0.166	100.0
0.3	$R_{\perp\!\!\!\perp}$	sharp	0.6	0.6	0.8	0.8	146	0.752	0.000*	0.942	0.059	-0.002	-0.001	-0.001	0.002	0.003	100.0
0.3	$R_+^{1\kappa}$	cons.	0.3	0.4	0.0	0.0	454	0.784	0.018*	0.939	0.007*	-0.001	0.227	-0.001	0.664	-0.173	100.0
0.3	$R_+^{1\kappa}$	cons.	0.3	0.4	0.3	0.3	413	0.795	0.239	0.952	0.586	0.020	0.225	0.090	-0.052	-0.347	100.0
0.3	$R_+^{1\kappa}$	cons.	0.3	0.4	0.6	0.6	291	0.798	0.382	0.940	0.017*	0.080	0.226	0.164	-0.135	-0.346	100.0
0.3	$R_+^{1\kappa}$	cons.	0.5	0.6	0.0	0.0	419	0.761	0.000*	0.957	0.065	-0.001	-0.059	0.001	-0.532	-0.714	100.0
0.3	$R_+^{1\kappa}$	cons.	0.5	0.6	0.3	0.3	381	0.769	0.000*	0.945	0.180	-0.007	-0.060	-0.024	0.020	0.205	100.0
0.3	$R_+^{1\kappa}$	cons.	0.5	0.6	0.6	0.6	268	0.791	0.105	0.942	0.040*	-0.022	-0.059	-0.042	0.064	0.192	100.0
0.3	$R_+^{1\kappa}$	sharp	0.3	0.4	0.3	0.3	408	0.787	0.036*	0.951	0.900	0.021	0.226	0.093	-0.060	-0.348	100.0
0.3	$R_+^{1\kappa}$	sharp	0.3	0.4	0.6	0.6	281	0.797	0.331	0.949	0.867	0.078	0.226	0.164	-0.138	-0.339	100.0
0.3	$R_+^{1\kappa}$	sharp	0.5	0.6	0.3	0.3	378	0.780	0.004*	0.947	0.451	-0.005	-0.060	-0.023	0.028	0.229	100.0
0.3	$R_+^{1\kappa}$	sharp	0.5	0.6	0.6	0.6	262	0.778	0.002*	0.945	0.209	-0.022	-0.058	-0.043	0.065	0.209	100.0
0.3	$R_-^{1\kappa}$	cons.	0.3	0.4	0.0	0.0	454	0.821	0.998	0.945	0.209	0.002	-0.060	-0.001	-4.520	-0.844	100.0
0.3	$R_-^{1\kappa}$	cons.	0.3	0.4	0.3	0.3	413	0.833	1.000	0.951	0.834	-0.007	-0.062	-0.026	0.034	0.181	100.0
0.3	$R_-^{1\kappa}$	cons.	0.3	0.4	0.6	0.6	291	0.833	1.000	0.952	0.706	-0.022	-0.060	-0.044	0.076	0.203	100.0
0.3	$R_-^{1\kappa}$	cons.	0.3	0.4	0.8	0.8	164	0.843	1.000	0.947	0.503	-0.040	-0.063	-0.056	0.116	0.193	100.0
0.3	$R_-^{1\kappa}$	cons.	0.5	0.6	0.0	0.0	419	0.769	0.000*	0.928	0.000*	-0.002	0.221	0.002	-0.466	2.165	100.0
0.3	$R_-^{1\kappa}$	cons.	0.5	0.6	0.3	0.3	381	0.790	0.097	0.916	0.000*	0.019	0.223	0.091	-0.069	-0.348	100.0
0.3	$R_-^{1\kappa}$	cons.	0.5	0.6	0.6	0.6	268	0.810	0.925	0.919	0.000*	0.079	0.223	0.162	-0.139	-0.343	100.0
0.3	$R_-^{1\kappa}$	cons.	0.5	0.6	0.8	0.8	151	0.698	0.000*	0.923	0.000*	0.143	0.226	0.200	-0.221	-0.342	100.0
0.3	$R_-^{1\kappa}$	sharp	0.3	0.4	0.3	0.3	408	0.837	1.000	0.947	0.451	-0.009	-0.062	-0.026	0.032	0.220	100.0
0.3	$R_-^{1\kappa}$	sharp	0.3	0.4	0.6	0.6	281	0.826	1.000	0.952	0.586	-0.021	-0.064	-0.046	0.072	0.205	100.0
0.3	$R_-^{1\kappa}$	sharp	0.3	0.4	0.8	0.8	156	0.835	1.000	0.953	0.426	-0.040	-0.063	-0.055	0.122	0.200	100.0
0.3	$R_-^{1\kappa}$	sharp	0.5	0.6	0.3	0.3	378	0.784	0.016*	0.929	0.000*	0.021	0.227	0.092	-0.053	-0.335	100.0
0.3	$R_-^{1\kappa}$	sharp	0.5	0.6	0.6	0.6	262	0.807	0.825	0.919	0.000*	0.080	0.225	0.162	-0.138	-0.337	100.0
0.3	$R_-^{1\kappa}$	sharp	0.5	0.6	0.8	0.8	146	0.694	0.000*	0.924	0.000*	0.145	0.230	0.203	-0.214	-0.336	100.0
0.3	$R_+^{2\kappa}$	cons.	0.4	0.4	0.0	0.0	454	0.783	0.011*	0.945	0.209	0.001	0.146	-0.001	1.766	-0.201	100.0
0.3	$R_+^{2\kappa}$	cons.	0.4	0.4	0.3	0.3	413	0.794	0.225	0.945	0.180	0.014	0.145	0.058	-0.039	-0.269	100.0
0.3	$R_+^{2\kappa}$	cons.	0.4	0.4	0.6	0.6	291	0.796	0.299	0.946	0.357	0.053	0.146	0.106	-0.100	-0.263	100.0
0.3	$R_+^{2\kappa}$	cons.	0.4	0.6	0.0	0.0	419	0.772	0.000*	0.947	0.402	-0.001	-0.002	0.001	-0.394	0.581	100.0

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Additional simulation results for design III when working assumption A1(a) is violated: responders' end-of-study variance is 25% below the appropriate lower bound.

δ	Response	Formula	r_{-1}	r_1	ρ	ρ_{size}	n	$1-\hat{\beta}$	p value	Coverage	p value	$\text{Cor}(R, Y_0^2)$	$\text{Cor}(R, Y_1^2)$	$\text{Cor}(R, Y_0Y_1)$	$\text{Cov}(Y_0, Y_2)$	$\text{Cov}(Y_1, Y_2)$	% Valid
0.3	$R_+^{2\kappa}$	cons.	0.4	0.6	0.3	0.3	381	0.770	0.000*	0.946	0.276	-0.002	-0.001	0.000	0.006	0.118	100.0
0.3	$R_+^{2\kappa}$	cons.	0.4	0.6	0.6	0.6	268	0.787	0.040*	0.941	0.021*	-0.001	0.001	0.001	0.034	0.097	100.0
0.3	$R_+^{2\kappa}$	cons.	0.6	0.4	0.0	0.0	454	0.784	0.014*	0.947	0.402	0.000	0.008	-0.001	-0.753	0.577	100.0
0.3	$R_+^{2\kappa}$	cons.	0.6	0.4	0.3	0.3	413	0.779	0.003*	0.950	0.967	0.001	-0.002	-0.001	-0.016	-0.106	100.0
0.3	$R_+^{2\kappa}$	cons.	0.6	0.4	0.6	0.6	291	0.797	0.348	0.949	0.737	0.001	0.001	0.001	-0.031	-0.096	100.0
0.3	$R_+^{2\kappa}$	cons.	0.6	0.4	0.8	0.8	164	0.819	0.997	0.941	0.026*	-0.001	-0.004	-0.003	-0.063	-0.105	100.0
0.3	$R_+^{2\kappa}$	cons.	0.6	0.6	0.0	0.0	419	0.760	0.000*	0.953	0.530	-0.001	-0.144	0.002	-0.147	-0.087	100.0
0.3	$R_+^{2\kappa}$	cons.	0.6	0.6	0.3	0.3	381	0.769	0.000*	0.949	0.737	-0.015	-0.144	-0.059	0.032	0.361	100.0
0.3	$R_+^{2\kappa}$	cons.	0.6	0.6	0.6	0.6	268	0.785	0.024*	0.944	0.154	-0.052	-0.145	-0.104	0.115	0.354	100.0
0.3	$R_+^{2\kappa}$	sharp	0.4	0.4	0.3	0.3	408	0.783	0.011*	0.946	0.357	0.014	0.146	0.060	-0.042	-0.269	100.0
0.3	$R_+^{2\kappa}$	sharp	0.4	0.4	0.6	0.6	281	0.797	0.365	0.943	0.094	0.051	0.146	0.106	-0.099	-0.256	100.0
0.3	$R_+^{2\kappa}$	sharp	0.4	0.6	0.3	0.3	378	0.780	0.004*	0.945	0.180	-0.001	0.005	0.003	0.021	0.135	100.0
0.3	$R_+^{2\kappa}$	sharp	0.4	0.6	0.6	0.6	262	0.790	0.083	0.949	0.737	-0.002	0.002	0.001	0.038	0.116	100.0
0.3	$R_+^{2\kappa}$	sharp	0.6	0.4	0.3	0.3	408	0.781	0.006*	0.949	0.867	-0.002	0.002	0.000	-0.015	-0.095	100.0
0.3	$R_+^{2\kappa}$	sharp	0.6	0.4	0.6	0.6	281	0.796	0.283	0.951	0.834	-0.003	0.004	0.002	-0.037	-0.091	100.0
0.3	$R_+^{2\kappa}$	sharp	0.6	0.4	0.8	0.8	156	0.800	0.489	0.950	0.967	-0.001	-0.002	-0.002	-0.053	-0.094	100.0
0.3	$R_+^{2\kappa}$	sharp	0.6	0.6	0.3	0.3	378	0.778	0.002*	0.946	0.276	-0.012	-0.143	-0.057	0.047	0.392	100.0
0.3	$R_+^{2\kappa}$	sharp	0.6	0.6	0.6	0.6	262	0.790	0.083	0.947	0.451	-0.053	-0.143	-0.105	0.112	0.362	100.0
0.3	$R_-^{2\kappa}$	cons.	0.4	0.4	0.0	0.0	454	0.787	0.044*	0.941	0.026*	0.001	-0.142	-0.000	-1.704	-0.348	100.0
0.3	$R_-^{2\kappa}$	cons.	0.4	0.4	0.3	0.3	413	0.784	0.018*	0.945	0.209	-0.015	-0.145	-0.059	0.045	0.332	100.0
0.3	$R_-^{2\kappa}$	cons.	0.4	0.4	0.6	0.6	291	0.777	0.001*	0.945	0.180	-0.051	-0.145	-0.105	0.124	0.353	100.0
0.3	$R_-^{2\kappa}$	cons.	0.4	0.4	0.8	0.8	164	0.757	0.000*	0.942	0.049*	-0.093	-0.149	-0.131	0.200	0.344	100.0
0.3	$R_-^{2\kappa}$	cons.	0.4	0.6	0.0	0.0	419	0.721	0.000*	0.941	0.026*	-0.001	-0.002	0.001	5.673	1.459	100.0
0.3	$R_-^{2\kappa}$	cons.	0.4	0.6	0.3	0.3	381	0.733	0.000*	0.942	0.049*	-0.002	0.002	0.002	-0.024	-0.095	100.0
0.3	$R_-^{2\kappa}$	cons.	0.4	0.6	0.6	0.6	268	0.736	0.000*	0.943	0.071	-0.002	-0.001	-0.001	-0.036	-0.097	100.0
0.3	$R_-^{2\kappa}$	cons.	0.6	0.4	0.0	0.0	454	0.841	1.000	0.945	0.241	0.002	0.007	-0.001	-1.448	-0.915	100.0
0.3	$R_-^{2\kappa}$	cons.	0.6	0.4	0.3	0.3	413	0.854	1.000	0.954	0.379	-0.002	-0.005	-0.003	0.021	0.081	100.0
0.3	$R_-^{2\kappa}$	cons.	0.6	0.4	0.6	0.6	291	0.849	1.000	0.955	0.224	0.003	0.004	0.003	0.048	0.110	100.0
0.3	$R_-^{2\kappa}$	cons.	0.6	0.4	0.8	0.8	164	0.857	1.000	0.946	0.357	0.003	-0.005	-0.005	0.064	0.099	100.0
0.3	$R_-^{2\kappa}$	cons.	0.6	0.6	0.0	0.0	419	0.761	0.000*	0.933	0.000*	-0.001	0.143	0.001	-0.662	1.989	100.0
0.3	$R_-^{2\kappa}$	cons.	0.6	0.6	0.3	0.3	381	0.786	0.027*	0.940	0.012*	0.012	0.144	0.059	-0.051	-0.268	100.0
0.3	$R_-^{2\kappa}$	cons.	0.6	0.6	0.6	0.6	268	0.807	0.825	0.928	0.000*	0.051	0.145	0.105	-0.103	-0.261	100.0
0.3	$R_-^{2\kappa}$	sharp	0.4	0.4	0.3	0.3	408	0.790	0.090	0.947	0.451	-0.015	-0.145	-0.059	0.041	0.367	100.0
0.3	$R_-^{2\kappa}$	sharp	0.4	0.4	0.6	0.6	281	0.765	0.000*	0.941	0.021*	-0.053	-0.146	-0.106	0.120	0.360	100.0
0.3	$R_-^{2\kappa}$	sharp	0.4	0.4	0.8	0.8	156	0.743	0.000*	0.948	0.557	-0.095	-0.149	-0.132	0.206	0.359	100.0
0.3	$R_-^{2\kappa}$	sharp	0.4	0.6	0.3	0.3	378	0.734	0.000*	0.953	0.530	0.001	0.004	0.003	-0.005	-0.076	100.0
0.3	$R_-^{2\kappa}$	sharp	0.4	0.6	0.6	0.6	262	0.720	0.000*	0.942	0.040*	-0.001	0.003	-0.001	-0.030	-0.084	100.0
0.3	$R_-^{2\kappa}$	sharp	0.6	0.4	0.3	0.3	408	0.850	1.000	0.944	0.154	-0.004	0.007	0.003	0.018	0.118	100.0
0.3	$R_-^{2\kappa}$	sharp	0.6	0.4	0.6	0.6	281	0.841	1.000	0.946	0.276	-0.001	-0.006	-0.005	0.041	0.111	100.0
0.3	$R_-^{2\kappa}$	sharp	0.6	0.4	0.8	0.8	156	0.846	1.000	0.949	0.737	0.002	-0.003	-0.003	0.070	0.109	100.0
0.3	$R_-^{2\kappa}$	sharp	0.6	0.6	0.3	0.3	378	0.789	0.064	0.934	0.000*	0.014	0.146	0.059	-0.039	-0.247	100.0
0.3	$R_-^{2\kappa}$	sharp	0.6	0.6	0.6	0.6	262	0.792	0.132	0.935	0.000*	0.052	0.146	0.105	-0.102	-0.254	100.0
0.5	R_+	cons.	0.4	0.4	0.0	0.0	164	0.776	0.001*	0.942	0.049*	0.001	0.078	0.008	-1.766	-0.749	100.0
0.5	R_+	cons.	0.4	0.4	0.3	0.3	149	0.811	0.938	0.948	0.675	0.010	0.083	0.033	-0.012	-0.101	100.0
0.5	R_+	cons.	0.4	0.4	0.6	0.6	105	0.810	0.925	0.940	0.017*	0.029	0.082	0.058	-0.058	-0.109	100.0

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Additional simulation results for design III when working assumption A1(a) is violated: responders' end-of-study variance is 25% below the appropriate lower bound.

δ	Response	Formula	r_{-1}	r_1	ρ	ρ_{size}	n	$1-\hat{\beta}$	p value	Coverage	p value	$\text{Cor}(R, Y_0^2)$	$\text{Cor}(R, Y_1^2)$	$\text{Cor}(R, Y_0 Y_1)$	$\text{Cov}(Y_0, Y_2)$	$\text{Cov}(Y_1, Y_2)$	% Valid
0.5	R_+	cons.	0.4	0.4	0.8	0.8	59	0.845	1.000	0.935	0.000*	0.052	0.081	0.072	-0.091	-0.109	100.0
0.5	R_+	cons.	0.4	0.6	0.0	0.0	151	0.776	0.001*	0.943	0.071	-0.002	0.012	0.003	-1.076	-1.442	100.0
0.5	R_+	cons.	0.4	0.6	0.3	0.3	138	0.797	0.348	0.942	0.049*	0.001	0.011	0.004	0.011	0.025	100.0
0.5	R_+	cons.	0.4	0.6	0.6	0.6	97	0.821	0.998	0.937	0.002*	0.004	0.013	0.007	0.007	0.017	100.0
0.5	R_+	cons.	0.4	0.6	0.8	0.8	55	0.839	1.000	0.937	0.002*	0.013	0.019	0.016	0.045	0.054	99.3
0.5	R_+	cons.	0.6	0.4	0.0	0.0	164	0.777	0.001*	0.947	0.402	0.001	0.012	0.007	-2.377	-1.452	100.0
0.5	R_+	cons.	0.6	0.4	0.3	0.3	149	0.802	0.632	0.948	0.615	0.002	0.011	0.007	-0.010	-0.040	100.0
0.5	R_+	cons.	0.6	0.4	0.6	0.6	105	0.814	0.977	0.941	0.033*	0.007	0.011	0.010	-0.025	-0.043	100.0
0.5	R_+	cons.	0.6	0.4	0.8	0.8	59	0.852	1.000	0.932	0.000*	0.009	0.012	0.012	-0.043	-0.048	100.0
0.5	R_+	cons.	0.6	0.6	0.0	0.0	151	0.778	0.001*	0.938	0.003*	-0.002	-0.060	0.002	-0.675	-2.581	100.0
0.5	R_+	cons.	0.6	0.6	0.3	0.3	138	0.800	0.489	0.941	0.026*	-0.004	-0.062	-0.025	0.032	0.093	100.0
0.5	R_+	cons.	0.6	0.6	0.6	0.6	97	0.826	1.000	0.934	0.000*	-0.025	-0.060	-0.044	0.040	0.081	100.0
0.5	R_+	cons.	0.6	0.6	0.8	0.8	55	0.837	1.000	0.935	0.000*	-0.039	-0.060	-0.053	0.087	0.113	99.4
0.5	R_+	sharp	0.4	0.4	0.3	0.3	147	0.787	0.044*	0.943	0.094	0.009	0.079	0.033	-0.021	-0.089	100.0
0.5	R_+	sharp	0.4	0.4	0.6	0.6	102	0.807	0.825	0.942	0.040*	0.028	0.081	0.060	-0.052	-0.097	100.0
0.5	R_+	sharp	0.4	0.4	0.8	0.8	57	0.823	0.999	0.934	0.000*	0.049	0.083	0.073	-0.084	-0.101	100.0
0.5	R_+	sharp	0.4	0.6	0.3	0.3	136	0.791	0.114	0.938	0.004*	0.007	0.009	0.005	-0.013	0.037	100.0
0.5	R_+	sharp	0.4	0.6	0.6	0.6	95	0.817	0.990	0.941	0.032*	0.008	0.013	0.013	0.018	0.032	100.0
0.5	R_+	sharp	0.4	0.6	0.8	0.8	53	0.829	1.000	0.933	0.000*	0.012	0.014	0.014	0.053	0.055	99.0
0.5	R_+	sharp	0.6	0.4	0.3	0.3	147	0.791	0.105	0.938	0.004*	0.001	0.010	0.007	-0.020	-0.027	100.0
0.5	R_+	sharp	0.6	0.4	0.6	0.6	102	0.808	0.858	0.943	0.071	0.005	0.013	0.008	-0.015	-0.032	100.0
0.5	R_+	sharp	0.6	0.4	0.8	0.8	57	0.831	1.000	0.937	0.002*	0.005	0.013	0.013	-0.030	-0.031	100.0
0.5	R_+	sharp	0.6	0.6	0.3	0.3	136	0.785	0.024*	0.934	0.000*	-0.006	-0.062	-0.024	-0.003	0.095	100.0
0.5	R_+	sharp	0.6	0.6	0.6	0.6	95	0.808	0.867	0.944	0.111	-0.017	-0.059	-0.042	0.051	0.096	100.0
0.5	R_+	sharp	0.6	0.6	0.8	0.8	53	0.827	1.000	0.935	0.000*	-0.036	-0.059	-0.051	0.101	0.117	99.0
0.5	R_-	cons.	0.4	0.4	0.0	0.0	164	0.787	0.040*	0.945	0.241	-0.002	0.080	-0.008	-0.646	-0.612	100.0
0.5	R_-	cons.	0.4	0.4	0.3	0.3	149	0.796	0.315	0.937	0.001*	0.007	0.081	0.032	-0.024	-0.101	100.0
0.5	R_-	cons.	0.4	0.4	0.6	0.6	105	0.798	0.382	0.937	0.002*	0.027	0.080	0.056	-0.059	-0.107	100.0
0.5	R_-	cons.	0.4	0.6	0.0	0.0	151	0.789	0.064	0.947	0.402	0.003	0.009	-0.003	-1.578	-1.141	100.0
0.5	R_-	cons.	0.4	0.6	0.3	0.3	138	0.786	0.030*	0.942	0.059	-0.003	0.010	0.006	0.007	0.016	100.0
0.5	R_-	cons.	0.4	0.6	0.6	0.6	97	0.776	0.001*	0.945	0.180	0.004	0.008	0.007	0.019	0.022	100.0
0.5	R_-	cons.	0.6	0.4	0.0	0.0	164	0.789	0.076	0.941	0.021*	-0.001	0.013	-0.008	-0.620	-1.134	100.0
0.5	R_-	cons.	0.6	0.4	0.3	0.3	149	0.798	0.399	0.945	0.241	-0.002	0.012	0.003	0.001	-0.027	100.0
0.5	R_-	cons.	0.6	0.4	0.6	0.6	105	0.786	0.033*	0.935	0.000*	0.003	0.011	0.009	-0.023	-0.042	100.0
0.5	R_-	cons.	0.6	0.4	0.8	0.8	59	0.785	0.019*	0.924	0.000*	0.013	0.009	0.012	-0.015	-0.031	100.0
0.5	R_-	cons.	0.6	0.6	0.0	0.0	151	0.783	0.010*	0.943	0.086	0.004	-0.062	-0.004	-1.064	-0.964	100.0
0.5	R_-	cons.	0.6	0.6	0.3	0.3	138	0.785	0.022*	0.944	0.154	-0.006	-0.061	-0.025	0.046	0.102	100.0
0.5	R_-	cons.	0.6	0.6	0.6	0.6	97	0.781	0.005*	0.942	0.040*	-0.024	-0.065	-0.044	0.055	0.088	100.0
0.5	R_-	sharp	0.4	0.4	0.3	0.3	147	0.797	0.331	0.949	0.737	0.009	0.078	0.030	-0.026	-0.104	100.0
0.5	R_-	sharp	0.4	0.4	0.6	0.6	102	0.777	0.001*	0.941	0.026*	0.030	0.078	0.057	-0.051	-0.102	100.0
0.5	R_-	sharp	0.4	0.6	0.3	0.3	136	0.783	0.010*	0.943	0.086	0.002	0.011	0.004	-0.004	0.002	100.0
0.5	R_-	sharp	0.4	0.6	0.6	0.6	95	0.760	0.000*	0.935	0.000*	0.002	0.007	0.006	0.002	0.029	100.0
0.5	R_-	sharp	0.6	0.4	0.3	0.3	147	0.795	0.268	0.947	0.402	0.003	0.008	0.002	-0.005	-0.038	100.0
0.5	R_-	sharp	0.6	0.4	0.6	0.6	102	0.782	0.007*	0.939	0.006*	0.008	0.011	0.010	-0.018	-0.035	100.0
0.5	R_-	sharp	0.6	0.4	0.8	0.8	57	0.775	0.000*	0.937	0.001*	0.004	0.009	0.008	-0.025	-0.031	100.0

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Additional simulation results for design III when working assumption A1(a) is violated: responders' end-of-study variance is 25% below the appropriate lower bound.

δ	Response	Formula	r_{-1}	r_1	ρ	ρ_{size}	n	$1-\hat{\beta}$	p value	Coverage	p value	$\text{Cor}(R, Y_0^2)$	$\text{Cor}(R, Y_1^2)$	$\text{Cor}(R, Y_0 Y_1)$	$\text{Cov}(Y_0, Y_2)$	$\text{Cov}(Y_1, Y_2)$	% Valid
0.5	R_-	sharp	0.6	0.6	0.3	0.3	136	0.772	0.000*	0.939	0.009*	-0.007	-0.060	-0.024	0.006	0.069	100.0
0.5	R_-	sharp	0.6	0.6	0.6	0.6	95	0.762	0.000*	0.937	0.002*	-0.022	-0.062	-0.047	0.035	0.082	100.0
0.5	$R_{\perp\!\!\!\perp}$	cons.	0.4	0.4	0.0	0.0	164	0.787	0.044*	0.950	0.933	-0.004	0.002	-0.001	-0.033	-0.738	100.0
0.5	$R_{\perp\!\!\!\perp}$	cons.	0.4	0.4	0.0	0.0	164	0.780	0.003*	0.943	0.071	0.003	-0.001	-0.003	1.791	-1.610	100.0
0.5	$R_{\perp\!\!\!\perp}$	cons.	0.4	0.4	0.3	0.3	149	0.804	0.699	0.942	0.059	-0.005	0.003	0.002	-0.021	0.009	100.0
0.5	$R_{\perp\!\!\!\perp}$	cons.	0.4	0.4	0.3	0.3	149	0.798	0.382	0.943	0.086	0.003	-0.002	0.002	-0.231	-0.229	100.0
0.5	$R_{\perp\!\!\!\perp}$	cons.	0.4	0.4	0.6	0.6	105	0.791	0.114	0.940	0.013*	-0.006	-0.004	-0.003	-0.008	-0.005	100.0
0.5	$R_{\perp\!\!\!\perp}$	cons.	0.4	0.4	0.6	0.6	105	0.807	0.848	0.938	0.003*	-0.001	0.001	-0.001	-0.136	-0.134	100.0
0.5	$R_{\perp\!\!\!\perp}$	cons.	0.4	0.4	0.8	0.8	59	0.831	1.000	0.931	0.000*	0.005	0.003	0.004	0.008	0.004	100.0
0.5	$R_{\perp\!\!\!\perp}$	cons.	0.4	0.4	0.8	0.8	59	0.836	1.000	0.942	0.049*	0.005	0.005	0.006	-0.052	-0.057	100.0
0.5	$R_{\perp\!\!\!\perp}$	cons.	0.4	0.6	0.0	0.0	151	0.769	0.000*	0.932	0.000*	-0.002	0.003	0.002	-1.059	1.022	100.0
0.5	$R_{\perp\!\!\!\perp}$	cons.	0.4	0.6	0.0	0.0	151	0.794	0.225	0.939	0.009*	0.005	-0.003	0.002	2.029	1.715	100.0
0.5	$R_{\perp\!\!\!\perp}$	cons.	0.4	0.6	0.3	0.3	138	0.775	0.000*	0.948	0.557	-0.003	0.004	0.005	-0.008	-0.012	100.0
0.5	$R_{\perp\!\!\!\perp}$	cons.	0.4	0.6	0.3	0.3	138	0.811	0.943	0.947	0.503	0.003	-0.001	-0.001	-0.255	-0.243	100.0
0.5	$R_{\perp\!\!\!\perp}$	cons.	0.4	0.6	0.6	0.6	97	0.786	0.029*	0.942	0.040*	-0.001	-0.003	-0.002	0.003	0.007	100.0
0.5	$R_{\perp\!\!\!\perp}$	cons.	0.4	0.6	0.6	0.6	97	0.818	0.995	0.941	0.032*	-0.004	-0.004	-0.008	-0.150	-0.149	100.0
0.5	$R_{\perp\!\!\!\perp}$	cons.	0.4	0.6	0.8	0.8	55	0.787	0.041*	0.939	0.007*	0.008	0.010	0.008	0.065	0.071	99.4
0.5	$R_{\perp\!\!\!\perp}$	cons.	0.4	0.6	0.8	0.8	55	0.832	1.000	0.936	0.001*	-0.002	0.003	0.001	-0.109	-0.105	99.2
0.5	$R_{\perp\!\!\!\perp}$	cons.	0.6	0.4	0.0	0.0	164	0.785	0.022*	0.952	0.706	0.002	-0.002	0.003	-0.004	0.309	100.0
0.5	$R_{\perp\!\!\!\perp}$	cons.	0.6	0.4	0.0	0.0	164	0.741	0.000*	0.944	0.154	-0.003	0.002	-0.001	2.201	0.962	100.0
0.5	$R_{\perp\!\!\!\perp}$	cons.	0.6	0.4	0.3	0.3	149	0.798	0.382	0.938	0.004*	-0.001	-0.003	-0.001	-0.010	0.011	100.0
0.5	$R_{\perp\!\!\!\perp}$	cons.	0.6	0.4	0.3	0.3	149	0.766	0.000*	0.945	0.180	0.003	0.001	0.003	-0.290	-0.291	100.0
0.5	$R_{\perp\!\!\!\perp}$	cons.	0.6	0.4	0.6	0.6	105	0.809	0.904	0.946	0.357	-0.004	0.001	-0.002	-0.015	-0.006	100.0
0.5	$R_{\perp\!\!\!\perp}$	cons.	0.6	0.4	0.6	0.6	105	0.795	0.239	0.943	0.094	0.002	0.005	0.006	-0.167	-0.167	100.0
0.5	$R_{\perp\!\!\!\perp}$	cons.	0.6	0.4	0.8	0.8	59	0.826	1.000	0.930	0.000*	0.002	0.003	-0.002	-0.001	-0.004	100.0
0.5	$R_{\perp\!\!\!\perp}$	cons.	0.6	0.4	0.8	0.8	59	0.797	0.344	0.928	0.000*	0.001	0.001	0.002	-0.078	-0.078	100.0
0.5	$R_{\perp\!\!\!\perp}$	cons.	0.6	0.6	0.0	0.0	151	0.767	0.000*	0.940	0.017*	0.002	0.003	0.003	-0.981	0.462	100.0
0.5	$R_{\perp\!\!\!\perp}$	cons.	0.6	0.6	0.0	0.0	151	0.780	0.003*	0.945	0.180	0.002	0.004	-0.005	3.002	1.579	100.0
0.5	$R_{\perp\!\!\!\perp}$	cons.	0.6	0.6	0.3	0.3	138	0.779	0.002*	0.946	0.357	0.003	0.005	0.005	0.007	-0.010	100.0
0.5	$R_{\perp\!\!\!\perp}$	cons.	0.6	0.6	0.3	0.3	138	0.781	0.005*	0.945	0.209	0.002	0.005	0.002	-0.327	-0.313	100.0
0.5	$R_{\perp\!\!\!\perp}$	cons.	0.6	0.6	0.6	0.6	97	0.786	0.029*	0.935	0.000*	0.002	0.004	0.002	0.005	0.009	100.0
0.5	$R_{\perp\!\!\!\perp}$	cons.	0.6	0.6	0.6	0.6	97	0.811	0.937	0.947	0.402	0.004	0.005	-0.003	-0.184	-0.188	100.0
0.5	$R_{\perp\!\!\!\perp}$	cons.	0.6	0.6	0.8	0.8	55	0.799	0.442	0.936	0.001*	0.004	-0.002	0.001	0.055	0.054	99.4
0.5	$R_{\perp\!\!\!\perp}$	cons.	0.6	0.6	0.8	0.8	55	0.816	0.988	0.944	0.110	0.003	0.004	0.002	-0.149	-0.147	99.2
0.5	$R_{\perp\!\!\!\perp}$	sharp	0.4	0.4	0.3	0.3	147	0.801	0.544	0.946	0.357	-0.003	0.003	0.001	-0.238	-0.243	100.0
0.5	$R_{\perp\!\!\!\perp}$	sharp	0.4	0.4	0.3	0.3	147	0.781	0.005*	0.941	0.026*	-0.003	-0.003	-0.002	-0.023	-0.003	100.0
0.5	$R_{\perp\!\!\!\perp}$	sharp	0.4	0.4	0.6	0.6	102	0.797	0.348	0.937	0.002*	0.005	-0.002	0.002	-0.130	-0.132	100.0
0.5	$R_{\perp\!\!\!\perp}$	sharp	0.4	0.4	0.6	0.6	102	0.801	0.580	0.947	0.451	0.003	0.002	0.001	0.006	0.006	100.0
0.5	$R_{\perp\!\!\!\perp}$	sharp	0.4	0.4	0.8	0.8	57	0.809	0.885	0.936	0.001*	0.008	-0.003	0.006	-0.068	-0.068	100.0
0.5	$R_{\perp\!\!\!\perp}$	sharp	0.4	0.4	0.8	0.8	57	0.796	0.299	0.933	0.000*	-0.007	-0.005	-0.007	-0.008	-0.008	100.0
0.5	$R_{\perp\!\!\!\perp}$	sharp	0.4	0.6	0.3	0.3	136	0.805	0.774	0.946	0.276	-0.004	0.003	0.002	-0.252	-0.243	100.0
0.5	$R_{\perp\!\!\!\perp}$	sharp	0.4	0.6	0.3	0.3	136	0.768	0.000*	0.943	0.094	0.003	0.002	-0.002	0.003	0.028	100.0
0.5	$R_{\perp\!\!\!\perp}$	sharp	0.4	0.6	0.6	0.6	95	0.823	0.999	0.941	0.033*	-0.003	-0.001	-0.002	-0.151	-0.150	100.0
0.5	$R_{\perp\!\!\!\perp}$	sharp	0.4	0.6	0.6	0.6	95	0.792	0.142	0.938	0.003*	-0.004	0.002	0.003	0.004	0.001	100.0
0.5	$R_{\perp\!\!\!\perp}$	sharp	0.4	0.6	0.8	0.8	53	0.812	0.955	0.935	0.000*	0.004	-0.005	-0.002	-0.101	-0.112	99.2

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Additional simulation results for design III when working assumption A1(a) is violated: responders' end-of-study variance is 25% below the appropriate lower bound.

δ	Response	Formula	r_{-1}	r_1	ρ	ρ_{size}	n	$1-\hat{\beta}$	p value	Coverage	p value	$\text{Cor}(R, Y_0^2)$	$\text{Cor}(R, Y_1^2)$	$\text{Cor}(R, Y_0 Y_1)$	$\text{Cov}(Y_0, Y_2)$	$\text{Cov}(Y_1, Y_2)$	% Valid
0.5	$R_{\perp\!\!\!\perp}$	sharp	0.4	0.6	0.8	0.8	53	0.780	0.004*	0.922	0.000*	0.005	0.006	0.006	0.072	0.080	99.2
0.5	$R_{\perp\!\!\!\perp}$	sharp	0.6	0.4	0.3	0.3	147	0.757	0.000*	0.946	0.315	0.003	0.002	0.003	-0.304	-0.302	100.0
0.5	$R_{\perp\!\!\!\perp}$	sharp	0.6	0.4	0.3	0.3	147	0.791	0.114	0.941	0.021*	-0.004	0.002	-0.002	-0.022	0.002	100.0
0.5	$R_{\perp\!\!\!\perp}$	sharp	0.6	0.4	0.6	0.6	102	0.787	0.040*	0.939	0.006*	0.002	0.005	0.003	-0.174	-0.171	100.0
0.5	$R_{\perp\!\!\!\perp}$	sharp	0.6	0.4	0.6	0.6	102	0.798	0.417	0.947	0.503	0.001	0.002	0.002	0.013	0.007	100.0
0.5	$R_{\perp\!\!\!\perp}$	sharp	0.6	0.4	0.8	0.8	57	0.806	0.785	0.942	0.040*	-0.007	-0.006	-0.008	-0.088	-0.090	100.0
0.5	$R_{\perp\!\!\!\perp}$	sharp	0.6	0.4	0.8	0.8	57	0.794	0.199	0.930	0.000*	-0.006	-0.004	-0.005	-0.005	-0.002	100.0
0.5	$R_{\perp\!\!\!\perp}$	sharp	0.6	0.6	0.3	0.3	136	0.778	0.002*	0.952	0.645	0.004	0.003	0.002	-0.318	-0.306	100.0
0.5	$R_{\perp\!\!\!\perp}$	sharp	0.6	0.6	0.3	0.3	136	0.774	0.000*	0.941	0.026*	0.004	0.005	0.005	0.022	0.038	100.0
0.5	$R_{\perp\!\!\!\perp}$	sharp	0.6	0.6	0.6	0.6	95	0.799	0.471	0.944	0.111	0.001	0.003	0.001	-0.192	-0.186	100.0
0.5	$R_{\perp\!\!\!\perp}$	sharp	0.6	0.6	0.6	0.6	95	0.787	0.044*	0.938	0.004*	-0.005	-0.005	-0.004	-0.005	-0.011	100.0
0.5	$R_{\perp\!\!\!\perp}$	sharp	0.6	0.6	0.8	0.8	53	0.795	0.255	0.930	0.000*	0.006	0.004	0.004	-0.143	-0.144	99.2
0.5	$R_{\perp\!\!\!\perp}$	sharp	0.6	0.6	0.8	0.8	53	0.778	0.002*	0.931	0.000*	0.001	0.008	0.003	0.061	0.078	99.2
0.5	$R_{+}^{1\kappa}$	cons.	0.3	0.4	0.0	0.0	164	0.791	0.105	0.949	0.801	0.000	0.235	-0.008	-0.374	-1.166	100.0
0.5	$R_{+}^{1\kappa}$	cons.	0.3	0.4	0.3	0.3	149	0.797	0.331	0.945	0.241	0.018	0.232	0.091	-0.070	-0.360	100.0
0.5	$R_{+}^{1\kappa}$	cons.	0.5	0.6	0.0	0.0	151	0.769	0.000*	0.945	0.209	-0.002	-0.056	-0.002	-2.185	-0.793	100.0
0.5	$R_{+}^{1\kappa}$	cons.	0.5	0.6	0.3	0.3	138	0.786	0.030*	0.952	0.645	-0.004	-0.054	-0.023	0.044	0.214	100.0
0.5	$R_{+}^{1\kappa}$	sharp	0.3	0.4	0.3	0.3	147	0.779	0.002*	0.944	0.154	0.019	0.232	0.091	-0.057	-0.366	100.0
0.5	$R_{+}^{1\kappa}$	sharp	0.5	0.6	0.3	0.3	136	0.780	0.004*	0.943	0.071	-0.007	-0.054	-0.022	0.008	0.201	100.0
0.5	$R_{-}^{1\kappa}$	cons.	0.3	0.4	0.0	0.0	164	0.809	0.896	0.941	0.026*	-0.002	-0.055	-0.007	1.033	2.637	100.0
0.5	$R_{-}^{1\kappa}$	cons.	0.3	0.4	0.3	0.3	149	0.806	0.813	0.946	0.276	-0.005	-0.055	-0.024	0.021	0.174	100.0
0.5	$R_{-}^{1\kappa}$	cons.	0.3	0.4	0.6	0.6	105	0.807	0.837	0.938	0.004*	-0.019	-0.055	-0.040	0.054	0.186	100.0
0.5	$R_{-}^{1\kappa}$	cons.	0.5	0.6	0.0	0.0	151	0.760	0.000*	0.933	0.000*	0.007	0.231	-0.003	-2.762	0.963	100.0
0.5	$R_{-}^{1\kappa}$	cons.	0.5	0.6	0.3	0.3	138	0.778	0.002*	0.929	0.000*	0.023	0.236	0.095	-0.035	-0.343	100.0
0.5	$R_{-}^{1\kappa}$	cons.	0.5	0.6	0.6	0.6	97	0.762	0.000*	0.923	0.000*	0.084	0.238	0.171	-0.136	-0.350	100.0
0.5	$R_{-}^{1\kappa}$	sharp	0.3	0.4	0.3	0.3	147	0.798	0.417	0.944	0.111	-0.007	-0.053	-0.024	0.021	0.190	100.0
0.5	$R_{-}^{1\kappa}$	sharp	0.3	0.4	0.6	0.6	102	0.805	0.774	0.945	0.209	-0.022	-0.058	-0.043	0.068	0.190	100.0
0.5	$R_{-}^{1\kappa}$	sharp	0.5	0.6	0.3	0.3	136	0.763	0.000*	0.927	0.000*	0.021	0.235	0.091	-0.048	-0.339	100.0
0.5	$R_{-}^{1\kappa}$	sharp	0.5	0.6	0.6	0.6	95	0.763	0.000*	0.923	0.000*	0.082	0.236	0.168	-0.141	-0.349	100.0
0.5	$R_{+}^{2\kappa}$	cons.	0.4	0.4	0.0	0.0	164	0.780	0.003*	0.944	0.154	-0.002	0.147	-0.008	-0.412	-1.578	100.0
0.5	$R_{+}^{2\kappa}$	cons.	0.4	0.4	0.3	0.3	149	0.786	0.033*	0.937	0.002*	0.013	0.148	0.057	-0.053	-0.273	100.0
0.5	$R_{+}^{2\kappa}$	cons.	0.4	0.4	0.6	0.6	105	0.803	0.666	0.940	0.017*	0.049	0.151	0.108	-0.122	-0.267	100.0
0.5	$R_{+}^{2\kappa}$	cons.	0.4	0.6	0.0	0.0	151	0.774	0.000*	0.944	0.111	0.003	-0.003	-0.002	-1.656	-5.558	100.0
0.5	$R_{+}^{2\kappa}$	cons.	0.4	0.6	0.3	0.3	138	0.787	0.044*	0.946	0.315	0.003	0.003	0.003	0.047	0.128	100.0
0.5	$R_{+}^{2\kappa}$	cons.	0.6	0.4	0.0	0.0	164	0.780	0.004*	0.947	0.503	-0.003	0.004	-0.008	0.602	-1.241	100.0
0.5	$R_{+}^{2\kappa}$	cons.	0.6	0.4	0.3	0.3	149	0.791	0.123	0.941	0.033*	-0.001	-0.009	-0.002	-0.024	-0.107	100.0
0.5	$R_{+}^{2\kappa}$	cons.	0.6	0.4	0.6	0.6	105	0.807	0.848	0.937	0.001*	-0.002	0.006	-0.006	-0.046	-0.093	100.0
0.5	$R_{+}^{2\kappa}$	cons.	0.6	0.6	0.0	0.0	151	0.770	0.000*	0.943	0.071	-0.003	-0.151	-0.002	-1.963	-0.832	100.0
0.5	$R_{+}^{2\kappa}$	cons.	0.6	0.6	0.3	0.3	138	0.774	0.000*	0.938	0.004*	-0.013	-0.150	-0.061	0.069	0.406	100.0
0.5	$R_{+}^{2\kappa}$	cons.	0.6	0.6	0.6	0.6	97	0.759	0.000*	0.937	0.002*	-0.051	-0.152	-0.108	0.128	0.374	100.0
0.5	$R_{+}^{2\kappa}$	sharp	0.4	0.4	0.3	0.3	147	0.783	0.011*	0.946	0.315	0.012	0.147	0.057	-0.048	-0.278	100.0
0.5	$R_{+}^{2\kappa}$	sharp	0.4	0.4	0.6	0.6	102	0.784	0.018*	0.941	0.026*	0.052	0.147	0.106	-0.104	-0.257	100.0
0.5	$R_{+}^{2\kappa}$	sharp	0.4	0.6	0.3	0.3	136	0.776	0.001*	0.944	0.154	-0.003	0.004	-0.001	0.001	0.117	100.0
0.5	$R_{+}^{2\kappa}$	sharp	0.6	0.4	0.3	0.3	147	0.781	0.005*	0.946	0.315	-0.001	-0.001	-0.002	-0.009	-0.121	100.0
0.5	$R_{+}^{2\kappa}$	sharp	0.6	0.4	0.6	0.6	102	0.782	0.008*	0.933	0.000*	-0.004	-0.003	-0.006	-0.030	-0.090	100.0

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Additional simulation results for design III when working assumption A1(a) is violated: responders' end-of-study variance is 25% below the appropriate lower bound.

δ	Response	Formula	r_{-1}	r_1	ρ	ρ_{size}	n	$1-\hat{\beta}$	p value	Coverage	p value	$\text{Cor}(R, Y_0^2)$	$\text{Cor}(R, Y_1^2)$	$\text{Cor}(R, Y_0 Y_1)$	$\text{Cov}(Y_0, Y_2)$	$\text{Cov}(Y_1, Y_2)$	% Valid
0.5	$R_+^{2\kappa}$	sharp	0.6	0.6	0.3	0.3	136	0.779	0.002*	0.946	0.276	-0.017	-0.147	-0.061	0.032	0.372	100.0
0.5	$R_+^{2\kappa}$	sharp	0.6	0.6	0.6	0.6	95	0.753	0.000*	0.940	0.013*	-0.056	-0.153	-0.114	0.121	0.360	100.0
0.5	$R_-^{2\kappa}$	cons.	0.4	0.4	0.0	0.0	164	0.793	0.163	0.936	0.001*	-0.002	-0.146	-0.007	0.974	0.696	100.0
0.5	$R_-^{2\kappa}$	cons.	0.4	0.4	0.3	0.3	149	0.778	0.002*	0.933	0.000*	-0.012	-0.151	-0.061	0.030	0.354	100.0
0.5	$R_-^{2\kappa}$	cons.	0.4	0.4	0.6	0.6	105	0.760	0.000*	0.934	0.000*	-0.052	-0.152	-0.110	0.105	0.355	100.0
0.5	$R_-^{2\kappa}$	cons.	0.4	0.6	0.0	0.0	151	0.757	0.000*	0.944	0.132	-0.004	-0.004	-0.002	-1.478	0.619	100.0
0.5	$R_-^{2\kappa}$	cons.	0.4	0.6	0.3	0.3	138	0.774	0.000*	0.941	0.026*	0.003	0.002	0.003	0.005	-0.091	100.0
0.5	$R_-^{2\kappa}$	cons.	0.6	0.4	0.0	0.0	164	0.795	0.253	0.937	0.002*	-0.001	0.006	-0.008	0.910	13.855	100.0
0.5	$R_-^{2\kappa}$	cons.	0.6	0.4	0.3	0.3	149	0.802	0.632	0.942	0.059	0.003	-0.004	-0.004	0.011	0.101	100.0
0.5	$R_-^{2\kappa}$	cons.	0.6	0.4	0.6	0.6	105	0.814	0.977	0.944	0.111	-0.002	-0.001	-0.001	0.022	0.103	100.0
0.5	$R_-^{2\kappa}$	cons.	0.6	0.6	0.0	0.0	151	0.774	0.000*	0.932	0.000*	0.005	0.147	-0.002	-3.255	-0.195	100.0
0.5	$R_-^{2\kappa}$	cons.	0.6	0.6	0.3	0.3	138	0.797	0.348	0.933	0.000*	0.017	0.150	0.061	-0.027	-0.266	100.0
0.5	$R_-^{2\kappa}$	cons.	0.6	0.6	0.6	0.6	97	0.775	0.000*	0.934	0.000*	0.052	0.150	0.109	-0.097	-0.263	100.0
0.5	$R_-^{2\kappa}$	sharp	0.4	0.4	0.3	0.3	147	0.774	0.000*	0.929	0.000*	-0.014	-0.148	-0.061	0.036	0.344	100.0
0.5	$R_-^{2\kappa}$	sharp	0.4	0.4	0.6	0.6	102	0.763	0.000*	0.939	0.009*	-0.055	-0.153	-0.112	0.113	0.354	100.0
0.5	$R_-^{2\kappa}$	sharp	0.4	0.6	0.3	0.3	136	0.773	0.000*	0.944	0.154	-0.003	0.001	-0.002	-0.001	-0.084	100.0
0.5	$R_-^{2\kappa}$	sharp	0.6	0.4	0.3	0.3	147	0.797	0.348	0.940	0.017*	-0.002	-0.000	-0.003	0.004	0.102	100.0
0.5	$R_-^{2\kappa}$	sharp	0.6	0.4	0.6	0.6	102	0.801	0.544	0.944	0.111	-0.003	-0.006	-0.004	0.033	0.106	100.0
0.5	$R_-^{2\kappa}$	sharp	0.6	0.6	0.3	0.3	136	0.781	0.006*	0.926	0.000*	0.013	0.149	0.058	-0.028	-0.254	100.0
0.5	$R_-^{2\kappa}$	sharp	0.6	0.6	0.6	0.6	95	0.765	0.000*	0.925	0.000*	0.052	0.150	0.107	-0.105	-0.256	100.0

Table S16: Additional simulation results for design III when working assumption A1(b) is violated: response is highly correlated with $(Y_1^{(d)} - \mu_1^{(d)})^2$

δ	Response	Formula	r_{-1}	r_1	ρ	ρ_{size}	n	$1-\hat{\beta}$	p value	Coverage	p value	$\text{Cor}(R, Y_0^2)$	$\text{Cor}(R, Y_1^2)$	$\text{Cor}(R, Y_0 Y_1)$	$\text{Cov}(Y_0, Y_2)$	$\text{Cov}(Y_1, Y_2)$	% Valid
0.3	R_+^2	cons.	0.4	0.4	0.0	0.0	454	0.794	0.199	0.939	0.007*	-0.002	0.690	-0.001	1.385	9.046	100.0
0.3	R_+^2	cons.	0.4	0.4	0.3	0.3	413	0.800	0.525	0.946	0.357	0.063	0.691	0.280	0.779	9.116	100.0
0.3	R_+^2	cons.	0.4	0.4	0.6	0.6	291	0.783	0.011*	0.940	0.017*	0.246	0.695	0.502	2.234	9.138	100.0
0.3	R_+^2	cons.	0.4	0.6	0.0	0.0	419	0.772	0.000*	0.951	0.900	-0.003	0.612	0.003	-2.752	3.360	100.0
0.3	R_+^2	cons.	0.4	0.6	0.3	0.3	381	0.779	0.002*	0.957	0.079	0.057	0.613	0.247	0.710	12.870	100.0
0.3	R_+^2	cons.	0.4	0.6	0.6	0.6	268	0.752	0.000*	0.946	0.315	0.219	0.616	0.445	2.099	12.764	100.0
0.3	R_+^2	cons.	0.6	0.4	0.0	0.0	454	0.799	0.471	0.944	0.132	-0.001	0.615	-0.000	0.587	-1.191	100.0
0.3	R_+^2	cons.	0.6	0.4	0.3	0.3	413	0.783	0.011*	0.945	0.180	0.056	0.615	0.247	0.732	10.358	100.0
0.3	R_+^2	cons.	0.6	0.4	0.6	0.6	291	0.788	0.053	0.946	0.276	0.219	0.616	0.448	2.179	10.573	100.0
0.3	R_+^2	cons.	0.6	0.6	0.0	0.0	419	0.769	0.000*	0.945	0.180	-0.002	0.534	0.002	-1.445	0.793	100.0
0.3	R_+^2	cons.	0.6	0.6	0.3	0.3	381	0.791	0.123	0.947	0.503	0.050	0.535	0.216	0.663	17.472	100.0
0.3	R_+^2	cons.	0.6	0.6	0.6	0.6	268	0.750	0.000*	0.950	0.967	0.190	0.538	0.388	2.019	17.264	100.0
0.3	R_+^2	sharp	0.4	0.4	0.3	0.3	408	0.793	0.163	0.946	0.276	0.062	0.691	0.279	0.782	9.321	100.0
0.3	R_+^2	sharp	0.4	0.4	0.6	0.6	281	0.772	0.000*	0.946	0.276	0.245	0.695	0.502	2.225	9.085	100.0
0.3	R_+^2	sharp	0.4	0.6	0.3	0.3	378	0.779	0.002*	0.952	0.645	0.054	0.615	0.247	0.662	12.708	100.0
0.3	R_+^2	sharp	0.4	0.6	0.6	0.6	262	0.767	0.000*	0.946	0.276	0.218	0.617	0.447	2.109	12.628	100.0
0.3	R_+^2	sharp	0.6	0.4	0.3	0.3	408	0.788	0.053	0.947	0.451	0.054	0.616	0.247	0.737	10.850	100.0
0.3	R_+^2	sharp	0.6	0.4	0.6	0.6	281	0.777	0.001*	0.948	0.615	0.217	0.619	0.446	2.159	10.366	100.0
0.3	R_+^2	sharp	0.6	0.6	0.3	0.3	378	0.776	0.001*	0.947	0.503	0.047	0.536	0.216	0.609	16.798	100.0
0.3	R_+^2	sharp	0.6	0.6	0.6	0.6	262	0.772	0.000*	0.946	0.315	0.192	0.539	0.390	2.039	16.862	100.0
0.3	R_-^2	cons.	0.4	0.4	0.0	0.0	454	0.745	0.000*	0.910	0.000*	-0.001	-0.424	0.001	-0.675	-1.690	100.0
0.3	R_-^2	cons.	0.4	0.4	0.3	0.3	413	0.711	0.000*	0.912	0.000*	-0.039	-0.423	-0.170	0.145	1.683	100.0
0.3	R_-^2	cons.	0.4	0.4	0.6	0.6	291	0.670	0.000*	0.914	0.000*	-0.152	-0.427	-0.309	0.422	1.669	100.0
0.3	R_-^2	cons.	0.4	0.4	0.8	0.8	164	0.632	0.000*	0.908	0.000*	-0.271	-0.428	-0.377	0.808	1.736	99.9
0.3	R_-^2	cons.	0.4	0.6	0.0	0.0	419	0.657	0.000*	0.904	0.000*	0.002	-0.354	-0.002	1.276	-1.301	100.0
0.3	R_-^2	cons.	0.4	0.6	0.3	0.3	381	0.641	0.000*	0.900	0.000*	-0.032	-0.356	-0.144	0.098	1.025	100.0
0.3	R_-^2	cons.	0.4	0.6	0.6	0.6	268	0.607	0.000*	0.910	0.000*	-0.126	-0.356	-0.257	0.295	1.094	100.0
0.3	R_-^2	cons.	0.4	0.6	0.8	0.8	151	0.602	0.000*	0.895	0.000*	-0.228	-0.360	-0.318	0.555	1.094	100.0
0.3	R_-^2	cons.	0.6	0.4	0.0	0.0	454	0.858	1.000	0.942	0.049*	0.001	-0.359	0.001	0.073	-2.210	100.0
0.3	R_-^2	cons.	0.6	0.4	0.3	0.3	413	0.850	1.000	0.943	0.086	-0.032	-0.354	-0.142	0.128	1.393	100.0
0.3	R_-^2	cons.	0.6	0.4	0.6	0.6	291	0.827	1.000	0.945	0.209	-0.127	-0.357	-0.258	0.357	1.357	100.0
0.3	R_-^2	cons.	0.6	0.4	0.8	0.8	164	0.846	1.000	0.944	0.154	-0.228	-0.359	-0.317	0.697	1.435	99.9
0.3	R_-^2	cons.	0.6	0.6	0.0	0.0	419	0.767	0.000*	0.938	0.003*	0.002	-0.285	-0.002	0.878	-2.839	100.0
0.3	R_-^2	cons.	0.6	0.6	0.3	0.3	381	0.781	0.005*	0.943	0.094	-0.026	-0.287	-0.117	0.073	0.831	100.0
0.3	R_-^2	cons.	0.6	0.6	0.6	0.6	268	0.779	0.003*	0.942	0.040*	-0.102	-0.288	-0.208	0.234	0.859	100.0
0.3	R_-^2	cons.	0.6	0.6	0.8	0.8	151	0.813	0.969	0.934	0.000*	-0.184	-0.292	-0.257	0.452	0.856	100.0
0.3	R_-^2	sharp	0.4	0.4	0.3	0.3	408	0.715	0.000*	0.907	0.000*	-0.039	-0.424	-0.173	0.148	1.682	100.0
0.3	R_-^2	sharp	0.4	0.4	0.6	0.6	281	0.662	0.000*	0.918	0.000*	-0.150	-0.425	-0.307	0.407	1.659	100.0
0.3	R_-^2	sharp	0.4	0.4	0.8	0.8	156	0.620	0.000*	0.921	0.000*	-0.272	-0.429	-0.378	0.802	1.689	99.9
0.3	R_-^2	sharp	0.4	0.6	0.3	0.3	378	0.632	0.000*	0.903	0.000*	-0.033	-0.359	-0.145	0.110	1.002	100.0
0.3	R_-^2	sharp	0.4	0.6	0.6	0.6	262	0.610	0.000*	0.902	0.000*	-0.126	-0.358	-0.259	0.301	1.083	100.0
0.3	R_-^2	sharp	0.4	0.6	0.8	0.8	146	0.580	0.000*	0.897	0.000*	-0.229	-0.365	-0.321	0.560	1.097	100.0
0.3	R_-^2	sharp	0.6	0.4	0.3	0.3	408	0.840	1.000	0.946	0.276	-0.031	-0.356	-0.144	0.130	1.370	100.0
0.3	R_-^2	sharp	0.6	0.4	0.6	0.6	281	0.835	1.000	0.947	0.402	-0.126	-0.358	-0.257	0.350	1.366	100.0
0.3	R_-^2	sharp	0.6	0.4	0.8	0.8	156	0.827	1.000	0.950	1.000	-0.228	-0.361	-0.318	0.669	1.369	99.9

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Additional simulation results for design III when working assumption A1(b) is violated: response is highly correlated with $(Y_1^{(d)} - \mu_1^{(d)})^2$

δ	Response	Formula	r_{-1}	r_1	ρ	ρ_{size}	n	$1-\hat{\beta}$	p value	Coverage	p value	$\text{Cor}(R, Y_0^2)$	$\text{Cor}(R, Y_1^2)$	$\text{Cor}(R, Y_0 Y_1)$	$\text{Cov}(Y_0, Y_2)$	$\text{Cov}(Y_1, Y_2)$	% Valid
0.3	R_-^2	sharp	0.6	0.6	0.3	0.3	378	0.771	0.000*	0.943	0.086	-0.027	-0.290	-0.117	0.091	0.779	100.0
0.3	R_-^2	sharp	0.6	0.6	0.6	0.6	262	0.785	0.024*	0.936	0.000*	-0.103	-0.290	-0.209	0.245	0.847	100.0
0.3	R_-^2	sharp	0.6	0.6	0.8	0.8	146	0.796	0.299	0.931	0.000*	-0.185	-0.296	-0.261	0.456	0.859	100.0
0.5	R_+^2	cons.	0.4	0.4	0.0	0.0	164	0.802	0.632	0.943	0.094	0.002	0.705	0.001	3.495	8.686	100.0
0.5	R_+^2	cons.	0.4	0.4	0.3	0.3	149	0.791	0.123	0.938	0.003*	0.062	0.706	0.281	0.781	9.259	100.0
0.5	R_+^2	cons.	0.4	0.4	0.6	0.6	105	0.798	0.417	0.949	0.737	0.246	0.714	0.511	2.209	9.064	100.0
0.5	R_+^2	cons.	0.4	0.6	0.0	0.0	151	0.777	0.001*	0.938	0.004*	0.002	0.624	-0.005	-5.192	12.786	100.0
0.5	R_+^2	cons.	0.4	0.6	0.3	0.3	138	0.782	0.008*	0.949	0.867	0.055	0.628	0.246	0.668	13.033	100.0
0.5	R_+^2	cons.	0.4	0.6	0.6	0.6	97	0.763	0.000*	0.937	0.002*	0.221	0.640	0.457	2.069	12.763	100.0
0.5	R_+^2	cons.	0.6	0.4	0.0	0.0	164	0.800	0.489	0.949	0.737	0.002	0.627	0.001	6.563	1.787	100.0
0.5	R_+^2	cons.	0.6	0.4	0.3	0.3	149	0.797	0.365	0.942	0.059	0.054	0.629	0.251	0.726	10.614	100.0
0.5	R_+^2	cons.	0.6	0.4	0.6	0.6	105	0.792	0.152	0.938	0.003*	0.220	0.636	0.457	2.167	10.544	100.0
0.5	R_+^2	cons.	0.6	0.6	0.0	0.0	151	0.772	0.000*	0.944	0.154	0.003	0.545	-0.004	1.260	1.910	100.0
0.5	R_+^2	cons.	0.6	0.6	0.3	0.3	138	0.782	0.007*	0.945	0.241	0.049	0.549	0.216	0.639	17.582	100.0
0.5	R_+^2	cons.	0.6	0.6	0.6	0.6	97	0.762	0.000*	0.942	0.040*	0.194	0.557	0.399	1.993	16.909	100.0
0.5	R_+^2	sharp	0.4	0.4	0.3	0.3	147	0.796	0.283	0.942	0.059	0.063	0.705	0.275	0.778	8.834	100.0
0.5	R_+^2	sharp	0.4	0.4	0.6	0.6	102	0.767	0.000*	0.941	0.033*	0.246	0.716	0.510	2.267	9.141	100.0
0.5	R_+^2	sharp	0.4	0.6	0.3	0.3	136	0.769	0.000*	0.935	0.000*	0.055	0.627	0.252	0.741	13.252	100.0
0.5	R_+^2	sharp	0.4	0.6	0.6	0.6	95	0.754	0.000*	0.942	0.049*	0.221	0.638	0.455	2.104	12.837	100.0
0.5	R_+^2	sharp	0.6	0.4	0.3	0.3	147	0.789	0.070	0.944	0.111	0.055	0.625	0.245	0.726	9.964	100.0
0.5	R_+^2	sharp	0.6	0.4	0.6	0.6	102	0.774	0.000*	0.947	0.451	0.218	0.636	0.453	2.184	10.380	100.0
0.5	R_+^2	sharp	0.6	0.6	0.3	0.3	136	0.776	0.001*	0.940	0.012*	0.049	0.548	0.220	0.664	18.486	100.0
0.5	R_+^2	sharp	0.6	0.6	0.6	0.6	95	0.751	0.000*	0.940	0.017*	0.194	0.558	0.398	2.037	17.229	100.0
0.5	R_-^2	cons.	0.4	0.4	0.0	0.0	164	0.797	0.341	0.927	0.000*	-0.002	-0.432	0.009	-1.575	7.417	99.9
0.5	R_-^2	cons.	0.4	0.4	0.3	0.3	149	0.761	0.000*	0.919	0.000*	-0.035	-0.433	-0.169	0.142	1.880	99.9
0.5	R_-^2	cons.	0.4	0.4	0.6	0.6	105	0.724	0.000*	0.927	0.000*	-0.148	-0.437	-0.311	0.490	1.796	99.1
0.5	R_-^2	cons.	0.4	0.4	0.8	0.8	59	0.732	0.000*	0.923	0.000*	-0.283	-0.449	-0.397	1.542	2.732	90.5
0.5	R_-^2	cons.	0.4	0.6	0.0	0.0	151	0.723	0.000*	0.922	0.000*	-0.005	-0.359	0.004	-0.264	16.451	100.0
0.5	R_-^2	cons.	0.4	0.6	0.3	0.3	138	0.720	0.000*	0.924	0.000*	-0.035	-0.365	-0.144	0.069	1.035	100.0
0.5	R_-^2	cons.	0.4	0.6	0.6	0.6	97	0.720	0.000*	0.920	0.000*	-0.128	-0.368	-0.264	0.304	1.114	99.8
0.5	R_-^2	cons.	0.4	0.6	0.8	0.8	55	0.736	0.000*	0.921	0.000*	-0.230	-0.378	-0.329	0.778	1.441	96.3
0.5	R_-^2	cons.	0.6	0.4	0.0	0.0	164	0.855	1.000	0.941	0.026*	-0.002	-0.363	0.009	-1.629	3.913	99.9
0.5	R_-^2	cons.	0.6	0.4	0.3	0.3	149	0.841	1.000	0.937	0.001*	-0.030	-0.365	-0.143	0.120	1.556	99.9
0.5	R_-^2	cons.	0.6	0.4	0.6	0.6	105	0.845	1.000	0.944	0.141	-0.126	-0.369	-0.264	0.421	1.487	99.1
0.5	R_-^2	cons.	0.6	0.4	0.8	0.8	59	0.857	1.000	0.939	0.011*	-0.238	-0.377	-0.333	1.360	2.285	90.7
0.5	R_-^2	cons.	0.6	0.6	0.0	0.0	151	0.787	0.036*	0.942	0.040*	0.004	-0.291	0.003	0.256	2.821	100.0
0.5	R_-^2	cons.	0.6	0.6	0.3	0.3	138	0.795	0.250	0.941	0.026*	-0.029	-0.295	-0.118	0.063	0.823	100.0
0.5	R_-^2	cons.	0.6	0.6	0.6	0.6	97	0.826	1.000	0.946	0.314	-0.104	-0.299	-0.215	0.232	0.865	99.9
0.5	R_-^2	cons.	0.6	0.6	0.8	0.8	55	0.869	1.000	0.933	0.000*	-0.189	-0.308	-0.269	0.633	1.121	96.7
0.5	R_-^2	sharp	0.4	0.4	0.3	0.3	147	0.780	0.004*	0.929	0.000*	-0.037	-0.429	-0.167	0.150	1.882	100.0
0.5	R_-^2	sharp	0.4	0.4	0.6	0.6	102	0.723	0.000*	0.931	0.000*	-0.152	-0.436	-0.313	0.540	1.858	99.0
0.5	R_-^2	sharp	0.4	0.4	0.8	0.8	57	0.699	0.000*	0.923	0.000*	-0.276	-0.449	-0.391	1.554	2.950	88.9
0.5	R_-^2	sharp	0.4	0.6	0.3	0.3	136	0.691	0.000*	0.920	0.000*	-0.032	-0.363	-0.144	0.101	1.052	99.9
0.5	R_-^2	sharp	0.4	0.6	0.6	0.6	95	0.722	0.000*	0.929	0.000*	-0.125	-0.367	-0.259	0.293	1.120	99.9
0.5	R_-^2	sharp	0.4	0.6	0.8	0.8	53	0.709	0.000*	0.912	0.000*	-0.233	-0.383	-0.333	0.875	1.495	95.9

Continued on next page

Additional simulation results for design III when working assumption A1(b) is violated: response is highly correlated with $(Y_1^{(d)} - \mu_1^{(d)})^2$

δ	Response	Formula	r_{-1}	r_1	ρ	ρ_{size}	n	$1-\hat{\beta}$	p value	Coverage	p value	$\text{Cor}(R, Y_0^2)$	$\text{Cor}(R, Y_1^2)$	$\text{Cor}(R, Y_0 Y_1)$	$\text{Cov}(Y_0, Y_2)$	$\text{Cov}(Y_1, Y_2)$	% Valid
0.5	R_-^2	sharp	0.6	0.4	0.3	0.3	147	0.846	1.000	0.939	0.009*	-0.031	-0.361	-0.140	0.143	1.460	100.0
0.5	R_-^2	sharp	0.6	0.4	0.6	0.6	102	0.834	1.000	0.944	0.119	-0.127	-0.366	-0.262	0.473	1.523	99.0
0.5	R_-^2	sharp	0.6	0.4	0.8	0.8	57	0.838	1.000	0.941	0.041*	-0.232	-0.379	-0.330	1.364	2.415	89.2
0.5	R_-^2	sharp	0.6	0.6	0.3	0.3	136	0.782	0.008*	0.938	0.003*	-0.027	-0.294	-0.116	0.086	0.832	99.9
0.5	R_-^2	sharp	0.6	0.6	0.6	0.6	95	0.821	0.999	0.946	0.276	-0.102	-0.298	-0.211	0.253	0.888	99.9
0.5	R_-^2	sharp	0.6	0.6	0.8	0.8	53	0.852	1.000	0.930	0.000*	-0.189	-0.310	-0.271	0.704	1.169	96.4

Table S17: Additional simulation results for design III when working assumption A1(c) is violated.

δ	Response	Formula	r_{-1}	r_1	ρ	ρ_{size}	n	$1-\hat{\beta}$	p value	Coverage	p value	Cor(R, Y_0^2)	Cor(R, Y_1^2)	Cor$(R, Y_0 Y_1)$	Cov(Y_0, Y_2)	Cov(Y_1, Y_2)	% Valid
0.3	$R_{\perp\!\!\perp}$	cons.	0.4	0.4	0.3	0.3	413	0.800	0.477	0.953	0.314	-0.002	-0.002	0.001	2.463	2.493	100.0
0.3	$R_{\perp\!\!\perp}$	cons.	0.4	0.4	0.6	0.6	291	0.787	0.010*	0.943	0.035*	-0.002	-0.002	-0.002	1.081	1.083	100.0
0.3	$R_{\perp\!\!\perp}$	cons.	0.4	0.6	0.3	0.3	381	0.789	0.028*	0.942	0.012*	0.001	-0.002	0.002	1.970	1.946	100.0
0.3	$R_{\perp\!\!\perp}$	cons.	0.4	0.6	0.6	0.6	268	0.755	0.000*	0.948	0.475	-0.001	-0.002	-0.001	2.275	2.280	100.0
0.3	$R_{\perp\!\!\perp}$	cons.	0.6	0.4	0.3	0.3	413	0.799	0.422	0.944	0.055	-0.000	0.000	-0.000	2.194	2.190	100.0
0.3	$R_{\perp\!\!\perp}$	cons.	0.6	0.4	0.6	0.6	291	0.784	0.002*	0.949	0.795	-0.001	0.001	0.000	1.550	1.559	100.0
0.3	$R_{\perp\!\!\perp}$	cons.	0.6	0.6	0.3	0.3	381	0.795	0.213	0.953	0.417	-0.001	-0.001	0.001	1.696	1.684	100.0
0.3	$R_{\perp\!\!\perp}$	cons.	0.6	0.6	0.6	0.6	268	0.754	0.000*	0.944	0.055	0.001	-0.002	-0.000	3.631	3.619	100.0
0.3	$R_{\perp\!\!\perp}$	sharp	0.4	0.4	0.3	0.3	408	0.794	0.165	0.949	0.746	-0.001	0.001	-0.001	2.465	2.487	100.0
0.3	$R_{\perp\!\!\perp}$	sharp	0.4	0.4	0.6	0.6	281	0.780	0.000*	0.942	0.015*	0.003	-0.001	0.000	1.105	1.103	100.0
0.3	$R_{\perp\!\!\perp}$	sharp	0.4	0.6	0.3	0.3	378	0.788	0.017*	0.948	0.559	0.002	-0.001	-0.001	1.932	1.923	100.0
0.3	$R_{\perp\!\!\perp}$	sharp	0.4	0.6	0.6	0.6	262	0.738	0.000*	0.945	0.119	-0.001	-0.001	-0.001	2.301	2.278	100.0
0.3	$R_{\perp\!\!\perp}$	sharp	0.6	0.4	0.3	0.3	408	0.786	0.007*	0.947	0.364	-0.001	-0.003	-0.001	2.184	2.234	100.0
0.3	$R_{\perp\!\!\perp}$	sharp	0.6	0.4	0.6	0.6	281	0.771	0.000*	0.946	0.153	0.001	0.001	-0.001	1.581	1.575	100.0
0.3	$R_{\perp\!\!\perp}$	sharp	0.6	0.6	0.3	0.3	378	0.787	0.010*	0.944	0.048*	0.001	0.000	0.001	1.679	1.646	100.0
0.3	$R_{\perp\!\!\perp}$	sharp	0.6	0.6	0.6	0.6	262	0.739	0.000*	0.947	0.270	0.001	0.002	0.002	3.673	3.592	100.0
0.5	$R_{\perp\!\!\perp}$	cons.	0.4	0.4	0.3	0.3	149	0.805	0.797	0.945	0.085	-0.001	-0.001	-0.001	2.524	2.579	100.0
0.5	$R_{\perp\!\!\perp}$	cons.	0.4	0.4	0.6	0.6	105	0.785	0.004*	0.937	0.000*	-0.001	0.001	-0.002	1.102	1.095	100.0
0.5	$R_{\perp\!\!\perp}$	cons.	0.4	0.6	0.3	0.3	138	0.788	0.017*	0.945	0.119	0.001	-0.001	-0.001	1.894	1.881	100.0
0.5	$R_{\perp\!\!\perp}$	cons.	0.4	0.6	0.6	0.6	97	0.759	0.000*	0.936	0.000*	-0.003	-0.002	-0.003	2.243	2.270	100.0
0.5	$R_{\perp\!\!\perp}$	cons.	0.6	0.4	0.3	0.3	149	0.802	0.617	0.941	0.003*	0.002	0.001	0.001	2.334	2.318	100.0
0.5	$R_{\perp\!\!\perp}$	cons.	0.6	0.4	0.6	0.6	105	0.789	0.028*	0.937	0.000*	0.004	0.004	0.005	1.662	1.637	100.0
0.5	$R_{\perp\!\!\perp}$	cons.	0.6	0.6	0.3	0.3	138	0.799	0.408	0.944	0.041*	-0.001	-0.002	-0.002	1.721	1.696	100.0
0.5	$R_{\perp\!\!\perp}$	cons.	0.6	0.6	0.6	0.6	97	0.774	0.000*	0.939	0.000*	-0.001	0.006	0.002	3.691	3.695	100.0
0.5	$R_{\perp\!\!\perp}$	sharp	0.4	0.4	0.3	0.3	147	0.793	0.105	0.945	0.085	-0.001	-0.002	-0.001	2.447	2.473	100.0
0.5	$R_{\perp\!\!\perp}$	sharp	0.4	0.4	0.6	0.6	102	0.765	0.000*	0.936	0.000*	0.001	0.001	-0.000	1.096	1.090	100.0
0.5	$R_{\perp\!\!\perp}$	sharp	0.4	0.6	0.3	0.3	136	0.786	0.008*	0.948	0.559	-0.004	-0.001	-0.001	1.875	1.914	100.0
0.5	$R_{\perp\!\!\perp}$	sharp	0.4	0.6	0.6	0.6	95	0.760	0.000*	0.938	0.000*	-0.001	-0.003	-0.003	2.184	2.183	100.0
0.5	$R_{\perp\!\!\perp}$	sharp	0.6	0.4	0.3	0.3	147	0.800	0.477	0.943	0.021*	0.001	0.001	0.001	2.282	2.241	100.0
0.5	$R_{\perp\!\!\perp}$	sharp	0.6	0.4	0.6	0.6	102	0.780	0.000*	0.941	0.003*	-0.001	0.002	-0.001	1.612	1.603	100.0
0.5	$R_{\perp\!\!\perp}$	sharp	0.6	0.6	0.3	0.3	136	0.797	0.291	0.947	0.364	0.001	0.001	-0.001	1.720	1.671	100.0
0.5	$R_{\perp\!\!\perp}$	sharp	0.6	0.6	0.6	0.6	95	0.757	0.000*	0.936	0.000*	0.002	0.002	0.002	3.516	3.551	100.0

Table S18: Additional simulation results for design III when working assumption A2 is violated: the true within-person correlation structure is AR(1) with correlation ρ

δ	Response	Formula	r_{-1}	r_1	ρ	ρ_{size}	n	$1-\hat{\beta}$	p value	Coverage	p value	$\text{Cor}(R, Y_0^2)$	$\text{Cor}(R, Y_1^2)$	$\text{Cor}(R, Y_0Y_1)$	$\text{Cov}(Y_0, Y_2)$	$\text{Cov}(Y_1, Y_2)$	% Valid
0.3	R_+	cons.	0.4	0.4	0.0	0.0	454	0.806	0.800	0.950	0.967	-0.001	0.077	0.001	2.356	-1.065	100.0
0.3	R_+	cons.	0.4	0.4	0.3	0.3	413	0.775	0.000*	0.951	0.769	0.009	0.080	0.032	-0.109	-0.095	100.0
0.3	R_+	cons.	0.4	0.4	0.6	0.6	291	0.687	0.000*	0.953	0.530	0.027	0.079	0.057	-0.100	-0.096	100.0
0.3	R_+	cons.	0.4	0.4	0.8	0.8	164	0.637	0.000*	0.940	0.013*	0.050	0.081	0.070	-0.107	-0.100	100.0
0.3	R_+	cons.	0.4	0.6	0.0	0.0	419	0.812	0.948	0.948	0.675	-0.000	0.009	-0.002	1.312	-1.817	100.0
0.3	R_+	cons.	0.4	0.6	0.3	0.3	381	0.763	0.000*	0.955	0.194	0.003	0.009	0.005	-0.000	0.027	100.0
0.3	R_+	cons.	0.4	0.6	0.6	0.6	268	0.714	0.000*	0.951	0.900	0.005	0.010	0.008	0.026	0.022	100.0
0.3	R_+	cons.	0.6	0.4	0.0	0.0	454	0.808	0.878	0.941	0.033*	-0.001	0.010	0.001	1.073	0.555	100.0
0.3	R_+	cons.	0.6	0.4	0.3	0.3	413	0.781	0.005*	0.955	0.258	0.002	0.013	0.005	-0.091	-0.038	100.0
0.3	R_+	cons.	0.6	0.4	0.6	0.6	291	0.694	0.000*	0.954	0.295	0.003	0.011	0.007	-0.039	-0.037	100.0
0.3	R_+	cons.	0.6	0.4	0.8	0.8	164	0.638	0.000*	0.942	0.049*	0.008	0.015	0.013	-0.045	-0.037	100.0
0.3	R_+	cons.	0.6	0.6	0.0	0.0	419	0.817	0.990	0.951	0.769	-0.000	-0.059	-0.002	0.981	-2.575	100.0
0.3	R_+	cons.	0.6	0.6	0.3	0.3	381	0.771	0.000*	0.959	0.029*	-0.004	-0.061	-0.024	0.064	0.085	100.0
0.3	R_+	cons.	0.6	0.6	0.6	0.6	268	0.709	0.000*	0.946	0.357	-0.021	-0.060	-0.042	0.085	0.081	100.0
0.3	R_+	sharp	0.4	0.4	0.3	0.3	408	0.766	0.000*	0.940	0.012*	0.010	0.078	0.032	-0.119	-0.106	100.0
0.3	R_+	sharp	0.4	0.4	0.6	0.6	281	0.678	0.000*	0.950	1.000	0.030	0.078	0.057	-0.109	-0.104	100.0
0.3	R_+	sharp	0.4	0.4	0.8	0.8	156	0.618	0.000*	0.940	0.012*	0.051	0.078	0.070	-0.095	-0.099	100.0
0.3	R_+	sharp	0.4	0.6	0.3	0.3	378	0.759	0.000*	0.948	0.675	0.001	0.008	0.002	-0.016	0.014	100.0
0.3	R_+	sharp	0.4	0.6	0.6	0.6	262	0.699	0.000*	0.947	0.451	0.003	0.009	0.008	0.016	0.023	100.0
0.3	R_+	sharp	0.6	0.4	0.3	0.3	408	0.752	0.000*	0.938	0.003*	0.004	0.011	0.005	-0.041	-0.043	100.0
0.3	R_+	sharp	0.6	0.4	0.6	0.6	281	0.680	0.000*	0.945	0.241	0.005	0.011	0.008	-0.047	-0.042	100.0
0.3	R_+	sharp	0.6	0.4	0.8	0.8	156	0.635	0.000*	0.943	0.071	0.007	0.010	0.009	-0.036	-0.039	100.0
0.3	R_+	sharp	0.6	0.6	0.3	0.3	378	0.758	0.000*	0.947	0.402	-0.006	-0.062	-0.025	0.022	0.074	100.0
0.3	R_+	sharp	0.6	0.6	0.6	0.6	262	0.703	0.000*	0.950	1.000	-0.022	-0.060	-0.043	0.073	0.079	100.0
0.3	R_-	cons.	0.4	0.4	0.0	0.0	454	0.813	0.965	0.946	0.357	0.001	0.080	-0.000	2.210	-0.640	100.0
0.3	R_-	cons.	0.4	0.4	0.3	0.3	413	0.765	0.000*	0.957	0.065	0.008	0.078	0.031	-0.081	-0.119	100.0
0.3	R_-	cons.	0.4	0.4	0.6	0.6	291	0.675	0.000*	0.954	0.379	0.030	0.080	0.058	-0.100	-0.096	100.0
0.3	R_-	cons.	0.4	0.4	0.8	0.8	164	0.617	0.000*	0.933	0.000*	0.050	0.077	0.069	-0.106	-0.108	100.0
0.3	R_-	cons.	0.4	0.6	0.0	0.0	419	0.806	0.800	0.949	0.737	0.001	0.009	0.002	1.799	1.982	100.0
0.3	R_-	cons.	0.4	0.6	0.3	0.3	381	0.773	0.000*	0.957	0.102	0.000	0.010	0.003	-0.029	0.018	100.0
0.3	R_-	cons.	0.4	0.6	0.6	0.6	268	0.684	0.000*	0.951	0.900	0.004	0.009	0.008	0.023	0.023	100.0
0.3	R_-	cons.	0.6	0.4	0.0	0.0	454	0.820	0.998	0.946	0.276	0.001	0.014	0.001	2.618	-1.712	100.0
0.3	R_-	cons.	0.6	0.4	0.3	0.3	413	0.770	0.000*	0.950	1.000	0.001	0.009	0.004	-0.030	-0.056	100.0
0.3	R_-	cons.	0.6	0.4	0.6	0.6	291	0.675	0.000*	0.954	0.379	0.006	0.010	0.008	-0.034	-0.032	100.0
0.3	R_-	cons.	0.6	0.4	0.8	0.8	164	0.614	0.000*	0.936	0.001*	0.006	0.008	0.008	-0.042	-0.045	100.0
0.3	R_-	cons.	0.6	0.6	0.0	0.0	419	0.814	0.977	0.951	0.834	-0.001	-0.060	0.003	-2.764	2.229	100.0
0.3	R_-	cons.	0.6	0.6	0.3	0.3	381	0.767	0.000*	0.957	0.079	-0.005	-0.059	-0.024	0.026	0.084	100.0
0.3	R_-	cons.	0.6	0.6	0.6	0.6	268	0.687	0.000*	0.948	0.615	-0.022	-0.059	-0.043	0.077	0.080	100.0
0.3	R_-	sharp	0.4	0.4	0.3	0.3	408	0.756	0.000*	0.948	0.615	0.008	0.080	0.031	-0.078	-0.095	100.0
0.3	R_-	sharp	0.4	0.4	0.6	0.6	281	0.656	0.000*	0.942	0.040*	0.029	0.079	0.057	-0.102	-0.107	100.0
0.3	R_-	sharp	0.4	0.4	0.8	0.8	156	0.590	0.000*	0.944	0.154	0.051	0.079	0.070	-0.099	-0.099	100.0
0.3	R_-	sharp	0.4	0.6	0.3	0.3	378	0.766	0.000*	0.950	0.933	0.004	0.012	0.006	0.143	0.021	100.0
0.3	R_-	sharp	0.4	0.6	0.6	0.6	262	0.659	0.000*	0.946	0.315	0.004	0.012	0.008	0.023	0.027	100.0
0.3	R_-	sharp	0.6	0.4	0.3	0.3	408	0.739	0.000*	0.942	0.040*	0.002	0.010	0.003	-0.005	-0.028	100.0
0.3	R_-	sharp	0.6	0.4	0.6	0.6	281	0.662	0.000*	0.945	0.209	0.004	0.009	0.006	-0.042	-0.044	100.0
0.3	R_-	sharp	0.6	0.4	0.8	0.8	156	0.602	0.000*	0.947	0.402	0.005	0.009	0.008	-0.034	-0.032	100.0

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Additional simulation results for design III when working assumption A2 is violated: the true within-person correlation structure is AR(1) with correlation ρ

δ	Response	Formula	r_{-1}	r_1	ρ	ρ_{size}	n	$1-\hat{\beta}$	p value	Coverage	p value	$\text{Cor}(R, Y_0^2)$	$\text{Cor}(R, Y_1^2)$	$\text{Cor}(R, Y_0 Y_1)$	$\text{Cov}(Y_0, Y_2)$	$\text{Cov}(Y_1, Y_2)$	% Valid
0.3	R_-	sharp	0.6	0.6	0.3	0.3	378	0.760	0.000*	0.945	0.209	-0.006	-0.060	-0.022	0.188	0.087	100.0
0.3	R_-	sharp	0.6	0.6	0.6	0.6	262	0.673	0.000*	0.948	0.615	-0.021	-0.059	-0.043	0.080	0.085	100.0
0.3	$R_{\perp\!\!\!\perp}$	cons.	0.4	0.4	0.0	0.0	454	0.806	0.813	0.947	0.402	-0.000	0.002	-0.001	1.721	-5.101	100.0
0.3	$R_{\perp\!\!\!\perp}$	cons.	0.4	0.4	0.3	0.3	413	0.766	0.000*	0.951	0.769	-0.002	0.001	-0.003	0.020	0.000	100.0
0.3	$R_{\perp\!\!\!\perp}$	cons.	0.4	0.4	0.6	0.6	291	0.682	0.000*	0.951	0.834	-0.002	-0.000	-0.001	0.004	0.001	100.0
0.3	$R_{\perp\!\!\!\perp}$	cons.	0.4	0.4	0.8	0.8	164	0.616	0.000*	0.944	0.111	-0.004	-0.002	-0.004	-0.001	-0.001	100.0
0.3	$R_{\perp\!\!\!\perp}$	cons.	0.4	0.6	0.0	0.0	419	0.800	0.507	0.953	0.426	-0.000	0.001	-0.001	-1.257	-1.328	100.0
0.3	$R_{\perp\!\!\!\perp}$	cons.	0.4	0.6	0.3	0.3	381	0.781	0.006*	0.954	0.295	0.003	0.001	0.002	-0.043	-0.010	100.0
0.3	$R_{\perp\!\!\!\perp}$	cons.	0.4	0.6	0.6	0.6	268	0.699	0.000*	0.945	0.180	0.003	0.001	0.003	0.000	0.002	100.0
0.3	$R_{\perp\!\!\!\perp}$	cons.	0.4	0.6	0.8	0.8	151	0.612	0.000*	0.937	0.001*	-0.002	0.001	-0.002	-0.005	0.003	100.0
0.3	$R_{\perp\!\!\!\perp}$	cons.	0.6	0.4	0.0	0.0	454	0.813	0.961	0.952	0.706	0.002	0.001	-0.001	2.936	-1.925	100.0
0.3	$R_{\perp\!\!\!\perp}$	cons.	0.6	0.4	0.3	0.3	413	0.777	0.001*	0.946	0.315	0.002	-0.001	0.001	0.016	0.003	100.0
0.3	$R_{\perp\!\!\!\perp}$	cons.	0.6	0.4	0.6	0.6	291	0.679	0.000*	0.955	0.224	0.002	0.003	0.003	0.004	0.006	100.0
0.3	$R_{\perp\!\!\!\perp}$	cons.	0.6	0.4	0.8	0.8	164	0.621	0.000*	0.947	0.503	0.002	0.004	0.004	0.005	0.002	100.0
0.3	$R_{\perp\!\!\!\perp}$	cons.	0.6	0.6	0.0	0.0	419	0.813	0.965	0.946	0.315	-0.000	0.002	0.001	1.959	0.065	100.0
0.3	$R_{\perp\!\!\!\perp}$	cons.	0.6	0.6	0.3	0.3	381	0.778	0.002*	0.958	0.054	0.001	0.002	0.002	-0.039	-0.003	100.0
0.3	$R_{\perp\!\!\!\perp}$	cons.	0.6	0.6	0.6	0.6	268	0.692	0.000*	0.949	0.867	-0.002	-0.003	-0.001	-0.005	-0.002	100.0
0.3	$R_{\perp\!\!\!\perp}$	cons.	0.6	0.6	0.8	0.8	151	0.605	0.000*	0.939	0.007*	0.002	0.003	0.003	0.001	0.005	100.0
0.3	$R_{\perp\!\!\!\perp}$	sharp	0.4	0.4	0.3	0.3	408	0.759	0.000*	0.944	0.132	-0.001	0.001	0.001	0.027	-0.005	100.0
0.3	$R_{\perp\!\!\!\perp}$	sharp	0.4	0.4	0.6	0.6	281	0.675	0.000*	0.943	0.094	-0.001	-0.000	-0.001	0.007	0.001	100.0
0.3	$R_{\perp\!\!\!\perp}$	sharp	0.4	0.4	0.8	0.8	156	0.597	0.000*	0.942	0.049*	0.001	0.003	0.002	0.007	0.006	100.0
0.3	$R_{\perp\!\!\!\perp}$	sharp	0.4	0.6	0.3	0.3	378	0.766	0.000*	0.949	0.737	-0.001	0.002	0.002	-0.052	-0.006	100.0
0.3	$R_{\perp\!\!\!\perp}$	sharp	0.4	0.6	0.6	0.6	262	0.677	0.000*	0.944	0.132	-0.002	0.001	-0.001	0.009	0.007	100.0
0.3	$R_{\perp\!\!\!\perp}$	sharp	0.4	0.6	0.8	0.8	146	0.586	0.000*	0.947	0.503	-0.002	0.003	0.004	0.004	0.006	100.0
0.3	$R_{\perp\!\!\!\perp}$	sharp	0.6	0.4	0.3	0.3	408	0.761	0.000*	0.941	0.021*	0.002	-0.002	0.002	0.032	-0.001	100.0
0.3	$R_{\perp\!\!\!\perp}$	sharp	0.6	0.4	0.6	0.6	281	0.677	0.000*	0.945	0.241	0.001	0.000	0.001	0.005	0.002	100.0
0.3	$R_{\perp\!\!\!\perp}$	sharp	0.6	0.4	0.8	0.8	156	0.603	0.000*	0.938	0.003*	0.002	0.003	0.002	0.001	0.001	100.0
0.3	$R_{\perp\!\!\!\perp}$	sharp	0.6	0.6	0.3	0.3	378	0.770	0.000*	0.945	0.180	-0.001	-0.003	-0.002	-0.045	-0.016	100.0
0.3	$R_{\perp\!\!\!\perp}$	sharp	0.6	0.6	0.6	0.6	262	0.682	0.000*	0.949	0.801	0.004	0.002	0.004	0.015	0.010	100.0
0.3	$R_{\perp\!\!\!\perp}$	sharp	0.6	0.6	0.8	0.8	146	0.587	0.000*	0.945	0.209	-0.002	-0.001	-0.001	0.004	0.004	100.0
0.5	R_+	cons.	0.4	0.4	0.0	0.0	164	0.792	0.152	0.941	0.026*	0.001	0.078	0.008	-2.077	-0.605	100.0
0.5	R_+	cons.	0.4	0.4	0.3	0.3	149	0.789	0.070	0.944	0.154	0.010	0.083	0.033	-0.037	-0.100	100.0
0.5	R_+	cons.	0.4	0.4	0.6	0.6	105	0.698	0.000*	0.937	0.002*	0.029	0.082	0.058	-0.114	-0.107	100.0
0.5	R_+	cons.	0.4	0.4	0.8	0.8	59	0.684	0.000*	0.938	0.003*	0.052	0.081	0.072	-0.121	-0.108	100.0
0.5	R_+	cons.	0.4	0.6	0.0	0.0	151	0.811	0.938	0.940	0.013*	-0.002	0.012	0.003	-1.188	-1.693	100.0
0.5	R_+	cons.	0.4	0.6	0.3	0.3	138	0.789	0.070	0.944	0.154	0.001	0.011	0.004	0.039	0.023	100.0
0.5	R_+	cons.	0.4	0.6	0.6	0.6	97	0.701	0.000*	0.939	0.007*	0.004	0.013	0.007	0.020	0.024	100.0
0.5	R_+	cons.	0.6	0.4	0.0	0.0	164	0.799	0.435	0.945	0.180	0.001	0.012	0.007	-3.145	-10.420	100.0
0.5	R_+	cons.	0.6	0.4	0.3	0.3	149	0.784	0.018*	0.946	0.276	0.002	0.011	0.007	-0.028	-0.040	100.0
0.5	R_+	cons.	0.6	0.4	0.6	0.6	105	0.703	0.000*	0.940	0.013*	0.007	0.011	0.010	-0.048	-0.040	100.0
0.5	R_+	cons.	0.6	0.4	0.8	0.8	59	0.678	0.000*	0.934	0.000*	0.009	0.012	0.012	-0.058	-0.047	100.0
0.5	R_+	cons.	0.6	0.6	0.0	0.0	151	0.805	0.745	0.939	0.007*	-0.002	-0.060	0.002	-0.470	-3.494	100.0
0.5	R_+	cons.	0.6	0.6	0.3	0.3	138	0.778	0.002*	0.944	0.111	-0.004	-0.062	-0.025	0.122	0.088	100.0
0.5	R_+	cons.	0.6	0.6	0.6	0.6	97	0.705	0.000*	0.936	0.001*	-0.025	-0.060	-0.044	0.089	0.088	100.0
0.5	R_+	sharp	0.4	0.4	0.3	0.3	147	0.775	0.000*	0.945	0.241	0.009	0.079	0.033	-0.109	-0.090	100.0

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Additional simulation results for design III when working assumption A2 is violated: the true within-person correlation structure is AR(1) with correlation ρ

δ	Response	Formula	r_{-1}	r_1	ρ	ρ_{size}	n	$1-\hat{\beta}$	p value	Coverage	p value	$\text{Cor}(R, Y_0^2)$	$\text{Cor}(R, Y_1^2)$	$\text{Cor}(R, Y_0Y_1)$	$\text{Cov}(Y_0, Y_2)$	$\text{Cov}(Y_1, Y_2)$	% Valid
0.5	R_+	sharp	0.4	0.4	0.6	0.6	102	0.685	0.000*	0.949	0.801	0.028	0.081	0.060	-0.100	-0.095	100.0
0.5	R_+	sharp	0.4	0.4	0.8	0.8	57	0.656	0.000*	0.938	0.003*	0.049	0.083	0.073	-0.109	-0.100	100.0
0.5	R_+	sharp	0.4	0.6	0.3	0.3	136	0.779	0.003*	0.941	0.021*	0.007	0.009	0.005	-0.050	0.029	100.0
0.5	R_+	sharp	0.4	0.6	0.6	0.6	95	0.713	0.000*	0.946	0.356	0.008	0.013	0.013	0.038	0.035	100.0
0.5	R_+	sharp	0.6	0.4	0.3	0.3	147	0.771	0.000*	0.942	0.040*	0.001	0.010	0.007	-0.086	-0.031	100.0
0.5	R_+	sharp	0.6	0.4	0.6	0.6	102	0.690	0.000*	0.943	0.094	0.005	0.013	0.008	-0.028	-0.029	100.0
0.5	R_+	sharp	0.6	0.4	0.8	0.8	57	0.661	0.000*	0.939	0.007*	0.005	0.013	0.013	-0.034	-0.030	100.0
0.5	R_+	sharp	0.6	0.6	0.3	0.3	136	0.771	0.000*	0.937	0.002*	-0.006	-0.062	-0.024	-0.011	0.089	100.0
0.5	R_+	sharp	0.6	0.6	0.6	0.6	95	0.701	0.000*	0.947	0.402	-0.017	-0.059	-0.042	0.096	0.098	100.0
0.5	R_-	cons.	0.4	0.4	0.0	0.0	164	0.804	0.730	0.944	0.132	-0.002	0.080	-0.008	-0.499	-0.428	100.0
0.5	R_-	cons.	0.4	0.4	0.3	0.3	149	0.765	0.000*	0.940	0.013*	0.007	0.081	0.032	-0.107	-0.102	100.0
0.5	R_-	cons.	0.4	0.4	0.6	0.6	105	0.661	0.000*	0.938	0.003*	0.027	0.080	0.056	-0.115	-0.109	100.0
0.5	R_-	cons.	0.4	0.6	0.0	0.0	151	0.813	0.965	0.945	0.209	0.003	0.009	-0.003	-1.958	-1.207	100.0
0.5	R_-	cons.	0.4	0.6	0.3	0.3	138	0.757	0.000*	0.945	0.241	-0.003	0.010	0.006	0.029	0.018	100.0
0.5	R_-	cons.	0.6	0.4	0.0	0.0	164	0.809	0.904	0.943	0.094	-0.001	0.013	-0.008	-0.468	-1.210	100.0
0.5	R_-	cons.	0.6	0.4	0.3	0.3	149	0.776	0.001*	0.945	0.180	-0.002	0.012	0.003	0.008	-0.031	100.0
0.5	R_-	cons.	0.6	0.4	0.6	0.6	105	0.661	0.000*	0.936	0.000*	0.003	0.011	0.009	-0.049	-0.046	100.0
0.5	R_-	cons.	0.6	0.6	0.0	0.0	151	0.808	0.878	0.944	0.132	0.004	-0.062	-0.004	-1.113	-0.916	100.0
0.5	R_-	cons.	0.6	0.6	0.3	0.3	138	0.762	0.000*	0.946	0.276	-0.006	-0.061	-0.025	0.195	0.100	100.0
0.5	R_-	sharp	0.4	0.4	0.3	0.3	147	0.765	0.000*	0.944	0.132	0.009	0.078	0.030	-0.152	-0.100	100.0
0.5	R_-	sharp	0.4	0.4	0.6	0.6	102	0.638	0.000*	0.942	0.059	0.030	0.078	0.057	-0.111	-0.103	100.0
0.5	R_-	sharp	0.4	0.6	0.3	0.3	136	0.763	0.000*	0.941	0.033*	0.002	0.011	0.004	-0.018	0.004	100.0
0.5	R_-	sharp	0.6	0.4	0.3	0.3	147	0.766	0.000*	0.946	0.276	0.003	0.008	0.002	-0.048	-0.034	100.0
0.5	R_-	sharp	0.6	0.4	0.6	0.6	102	0.654	0.000*	0.942	0.049*	0.008	0.011	0.010	-0.047	-0.036	100.0
0.5	R_-	sharp	0.6	0.6	0.3	0.3	136	0.750	0.000*	0.937	0.002*	-0.007	-0.060	-0.024	0.020	0.072	100.0
0.5	$R_{\perp\!\!\!\perp}$	cons.	0.4	0.4	0.0	0.0	164	0.811	0.932	0.949	0.737	-0.004	0.002	-0.001	0.422	-1.418	100.0
0.5	$R_{\perp\!\!\!\perp}$	cons.	0.4	0.4	0.3	0.3	149	0.783	0.011*	0.946	0.357	-0.005	0.003	0.002	-0.064	0.007	100.0
0.5	$R_{\perp\!\!\!\perp}$	cons.	0.4	0.4	0.6	0.6	105	0.674	0.000*	0.940	0.012*	-0.006	-0.004	-0.003	-0.004	-0.004	100.0
0.5	$R_{\perp\!\!\!\perp}$	cons.	0.4	0.4	0.8	0.8	59	0.635	0.000*	0.927	0.000*	0.005	0.003	0.004	0.009	0.003	100.0
0.5	$R_{\perp\!\!\!\perp}$	cons.	0.4	0.6	0.0	0.0	151	0.797	0.365	0.932	0.000*	-0.002	0.003	0.002	-1.109	1.040	100.0
0.5	$R_{\perp\!\!\!\perp}$	cons.	0.4	0.6	0.3	0.3	138	0.763	0.000*	0.948	0.615	-0.003	0.004	0.005	-0.010	-0.007	100.0
0.5	$R_{\perp\!\!\!\perp}$	cons.	0.4	0.6	0.6	0.6	97	0.662	0.000*	0.942	0.040*	-0.001	-0.003	-0.002	0.008	0.009	100.0
0.5	$R_{\perp\!\!\!\perp}$	cons.	0.4	0.6	0.8	0.8	55	0.622	0.000*	0.944	0.120	0.008	0.010	0.008	0.069	0.067	99.4
0.5	$R_{\perp\!\!\!\perp}$	cons.	0.6	0.4	0.0	0.0	164	0.807	0.837	0.952	0.645	0.002	-0.002	0.003	0.120	-0.041	100.0
0.5	$R_{\perp\!\!\!\perp}$	cons.	0.6	0.4	0.3	0.3	149	0.776	0.001*	0.943	0.094	-0.001	-0.003	-0.001	-0.032	0.010	100.0
0.5	$R_{\perp\!\!\!\perp}$	cons.	0.6	0.4	0.6	0.6	105	0.690	0.000*	0.947	0.402	-0.004	0.001	-0.002	-0.015	-0.003	100.0
0.5	$R_{\perp\!\!\!\perp}$	cons.	0.6	0.4	0.8	0.8	59	0.641	0.000*	0.934	0.000*	0.002	0.003	-0.002	-0.003	-0.003	100.0
0.5	$R_{\perp\!\!\!\perp}$	cons.	0.6	0.6	0.0	0.0	151	0.801	0.544	0.935	0.000*	0.002	0.003	0.003	-0.976	0.120	100.0
0.5	$R_{\perp\!\!\!\perp}$	cons.	0.6	0.6	0.3	0.3	138	0.768	0.000*	0.950	1.000	0.003	0.005	0.005	0.045	-0.007	100.0
0.5	$R_{\perp\!\!\!\perp}$	cons.	0.6	0.6	0.6	0.6	97	0.664	0.000*	0.938	0.003*	0.002	0.004	0.002	0.009	0.011	100.0
0.5	$R_{\perp\!\!\!\perp}$	cons.	0.6	0.6	0.8	0.8	55	0.625	0.000*	0.938	0.003*	0.004	-0.002	0.001	0.053	0.049	99.4
0.5	$R_{\perp\!\!\!\perp}$	sharp	0.4	0.4	0.3	0.3	147	0.754	0.000*	0.941	0.033*	-0.003	-0.003	-0.002	-0.055	0.002	100.0
0.5	$R_{\perp\!\!\!\perp}$	sharp	0.4	0.4	0.6	0.6	102	0.675	0.000*	0.944	0.111	0.003	0.002	0.001	0.004	0.006	100.0
0.5	$R_{\perp\!\!\!\perp}$	sharp	0.4	0.4	0.8	0.8	57	0.611	0.000*	0.934	0.000*	-0.007	-0.005	-0.007	-0.009	-0.008	100.0
0.5	$R_{\perp\!\!\!\perp}$	sharp	0.4	0.6	0.3	0.3	136	0.748	0.000*	0.945	0.241	0.003	0.002	-0.002	-0.008	0.022	100.0

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Additional simulation results for design III when working assumption A2 is violated: the true within-person correlation structure is AR(1) with correlation ρ

δ	Response	Formula	r_{-1}	r_1	ρ	ρ_{size}	n	$1-\hat{\beta}$	p value	Coverage	p value	Cor(R, Y_0^2)	Cor(R, Y_1^2)	Cor(R, Y_0Y_1)	Cov(Y_0, Y_2)	Cov(Y_1, Y_2)	% Valid
0.5	$R_{\perp\!\!\!\perp}$	sharp	0.4	0.6	0.6	0.6	95	0.679	0.000*	0.936	0.001*	-0.004	0.002	0.003	0.010	0.001	100.0
0.5	$R_{\perp\!\!\!\perp}$	sharp	0.4	0.6	0.8	0.8	53	0.614	0.000*	0.932	0.000*	0.005	0.006	0.006	0.078	0.077	99.2
0.5	$R_{\perp\!\!\!\perp}$	sharp	0.6	0.4	0.3	0.3	147	0.764	0.000*	0.943	0.094	-0.004	0.002	-0.002	-0.046	0.006	100.0
0.5	$R_{\perp\!\!\!\perp}$	sharp	0.6	0.4	0.6	0.6	102	0.672	0.000*	0.945	0.209	0.001	0.002	0.002	0.019	0.006	100.0
0.5	$R_{\perp\!\!\!\perp}$	sharp	0.6	0.4	0.8	0.8	57	0.610	0.000*	0.934	0.000*	-0.006	-0.004	-0.005	-0.003	-0.001	100.0
0.5	$R_{\perp\!\!\!\perp}$	sharp	0.6	0.6	0.3	0.3	136	0.757	0.000*	0.944	0.154	0.004	0.005	0.005	0.063	0.032	100.0
0.5	$R_{\perp\!\!\!\perp}$	sharp	0.6	0.6	0.6	0.6	95	0.674	0.000*	0.942	0.059	-0.005	-0.005	-0.004	-0.002	-0.011	100.0
0.5	$R_{\perp\!\!\!\perp}$	sharp	0.6	0.6	0.8	0.8	53	0.608	0.000*	0.938	0.003*	0.001	0.008	0.003	0.066	0.079	99.2

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