Appendix

Table of Contents

Appendix A. Bias and efficiency results for standardized and unstandardized mean differences A-1
Appendix B. Bias, efficiency, and theoretical variance for all effect size indexes and their variances. B-9

Tables

Table 1. Bias of the Effect Sizes Metrics as a Function of Normality, the Parametric Effect Size, and Sample Size, Assuming Fixed-Effects. A-1
Table 2. Bias of the Effect Sizes Metrics under Random Effects ($\tau^2 = 0.08$) A-2
Table 3. Bias of the Effect Sizes Metrics under Random Effects ($\tau^2 = 0.32$). A-3
Table 4. Bias of the Effect Sizes Metrics as a Function of Normality, Heteroskedastic, and Between-studies variance. A-4
Table 5. Efficiency of the Effect Sizes Metrics as a Function of assuming fixed effects. A-5
Table 6. Efficiency of the Effect Sizes Indexes as a Function of under Random Effects ($\tau^2 = 0.08$). A-6
Table 7. Efficiency of the Effect Sizes Indexes as a Function of under Random Effects ($\tau^2 = 0.32$). A-7
Table 8. Efficiency of the Effect Sizes Metrics as a Function of Normality, Heteroskedastic, and Between-studies variance. A-8
Table 9. Correspondence of Raw-Score Parametric Effect Size, $\delta_{raw} = 0.5$ ($\sigma_{raw} = 1$) in with Change-Score Metrics. B-9
Table 10. Descriptive Statistics for a Hypothetical Study Using a One-Group Design with Repeated Measures between Pretest and Posttest. B-9
Table 11. Descriptive Statistics for a Hypothetical Study using a Two-Group Design with Repeated Measures between Pretest and Posttest. B-9
Table 12. Comparison of Pretest and Posttest Means for the Experimental Group (Table 11), Assuming that the Observations Derive from Two Independent Groups. B-10
Table 13. Standardized Mean Difference ES Estimations for a One-Group Repeated-Measures Design and Illustrated with Table 10's Data. B-10
Table 14. Standardized Mean Difference ES Estimations for Two Independent Groups. B-11
Table 15. Estimates of Sampling Variance for a One-Group Within-Subjects Design, Illustrated with Data from Table 10 ..... B-1
Table 16. Estimates of Sampling Variances for Two-Group Designs with Repeated Measures. .. B-2
Table 17. Bias of Repeated Measures ES Indexes under Differing Sample Sizes (n) and Correlations (r) between the Pretest and Posttest. B-3
Table 18. Bias for Repeated Measures ES Indexes as a Function of the Correlations (r) between Pretest and Posttest. B-4
Table 21. Efficiency of the ES Indexes under Differing Sample Sizes (n) and Correlations (r) between the Pretest and Posttest. B-5
Table 22. Efficiency for the ES Indexes as a Function of the Correlation (r) between Pretest and Posttest. B-6

Table 23. Theoretical Variance Adjustment to the Empirical Variance under Differing Sample Sizes (n) and Correlations (r) between the Pretest and Posttest. B-6
Table 24. Theoretical Variance Adjustment to the Empirical Variance as a Function of the Correlation (r) between Pretest and Posttest. B-7
Table 25. Bias of the ES Indexes as a Function of Sample Size (n) and the Correlation (r) between Pretest and Posttest. B-7
Table 26. Bias of the ES Indexes as a Function of the Correlation (r) between Pretest and Posttest. B-8
Table 29. Efficiency of the ES indexes as a Function of Sample Size (n) and the Correlation (r) between Pretest and Posttest. B-10
Table 30. Mean Efficiency for the ES Indexes as a Function of the Correlation (r) between Pretest and Posttest. B-11
Table 31. Theoretical Variance Adjustment to the Empirical Variance for those formulas that consider the ES a sum of two ES or as a Total ES. B-11
Table 32. Mean of Theoretical Variance Adjustment to the Empirical Variance as a Function of the Correlation (r). B-12
Table 33. Theoretical Variance Adjustment to the Empirical Variance for those Formulas Considering the ES as a Total Value and Including or Excluding the Correlation (r) Factor into the Equation. B-12
Table 34. Mean of Theoretical Variance Adjustment to the Empirical Variance as a Function of the Correlation ®. B-13

Appendix A. Bias and efficiency results for standardized and raw mean differences

This appendix contains the results of bias and efficiency for the two different effect sizes metrics, raw (UMD) versus standardized (SMD) mean differences by the conditions that varied among them significantly.

Table 1. Bias of the Effect Sizes Metrics as a Function of Deviations from Normality, the Parametric Effect Size, and Sample Size, under Fixed-Effects Assumptions.

Normality (Skewness/Kurtosis)	*δ*	*n*	*SMD*	*UMD*
0/3	0.25	30	-0.0003	0.0210
		50	-0.0005	0.0239
		80	-0.0003	0.0261
	0.5	30	-0.0003	0.0284
		50	-0.0005	0.0309
		80	-0.0003	0.0333
	0.8	30	-0.0003	0.0078
		50	-0.0005	0.0099
		80	-0.0003	0.0122
0.75/0	0.25	30	-0.1021	0.1389
		50	-0.1035	0.1322
		80	-0.1043	0.1346
	0.5	30	-0.1021	0.1605
		50	-0.1035	0.1639
		80	-0.1043	0.1667
	0.8	30	-0.1021	0.1923
		50	-0.1035	0.1955
		80	-0.1043	0.1985
1.75/3.75	0.25	30	0.2001	0.2369
		50	-0.2104	0.2404
		80	-0.2002	0.2431
	0.5	30	0.2001	0.2925
		50	-0.2104	0.2967
		80	-0.2002	0.3001
	0.8	30	0.2001	0.3767
		50	-0.2104	0.3812
		80	-0.2002	0.3848

Table 2. Bias of the Effect Sizes Metrics under RandomEffects Assumptions ($\tau^2 = 0.08$)

Normality	*δ*	*n*	*SMD*	*UMD*
0/3	0.25	30	0.0001	0.0175
		50	0.0019	0.0257
		80	0.0017	0.0279
	0.5	30	0.0001	0.0259
		50	0.0019	0.0334
		80	0.0017	0.0353
	0.8	30	0.0001	0.0066
		50	0.0019	0.0131
		80	0.0017	0.0146
0.75/0	0.25	30	0.1001	0.1750
		50	0.1019	0.1839
		80	0.1017	0.1864
	0.5	30	0.1001	0.1573
		50	0.1019	0.1663
		80	0.1017	0.1688
	0.8	30	0.1001	0.1907
		50	0.1019	0.1991
		80	0.1017	0.2012
1.75/3.75	0.25	30	0.1001	0.1325
		50	0.1019	0.1421
		80	0.1017	0.1448
	0.5	30	0.1001	0.2887
		50	0.1019	0.2992
		80	0.1017	0.3023
	0.8	30	0.1001	0.3748
		50	0.1019	0.3851
		80	0.1017	0.3879

Table 3. Bias of the Effect Sizes Metrics under Random-Effects Assumptions ($\tau^2 = 0.32$).

Normality	*δ*	*n*	*SMD*	*UMD*
0/3	0.25	30	0.0001	0.0175
		50	0.0019	0.0257
		80	0.0017	0.0279
	0.5	30	0.0001	0.0259
		50	0.0019	0.0334
		80	0.0017	0.0353
	0.8	30	0.0001	0.0066
		50	0.0019	0.0131
		80	0.0017	0.0146
0.75/0	0.25	30	0.1001	0.1750
		50	0.1019	0.1839
		80	0.1017	0.1864
	0.5	30	0.1001	0.1573
		50	0.1019	0.1663
		80	0.1017	0.1688
	0.8	30	0.1001	0.1907
		50	0.1019	0.1991
		80	0.1017	0.2012
1.75/3.75	0.25	30	0.1001	0.1325
		50	0.1019	0.1421
		80	0.1017	0.1448
	0.5	30	0.1001	0.2887
		50	0.1019	0.2992
		80	0.1017	0.3023
	0.8	30	0.1001	0.3748
		50	0.1019	0.3851
		80	0.1017	0.3879

Table 4. Bias of the Effect Sizes Metrics as a Function of Deviations from Normality, Heteroskedasticity, and Between-Studies Variance.

Normality	*Heteroskedastic*	τ^2	*SMD*	*UMD*
0/3	1:1	0	0.0001	0.0175
		0.08	0.0019	0.0257
		0.32	0.0017	0.0279
	1:2	0	0.0001	0.0259
		0.08	0.0019	0.0334
		0.32	0.0017	0.0353
	4:1	0	0.0001	0.0366
		0.08	0.0019	0.0431
		0.32	0.0017	0.0546
0.75/0	1:1	0	0.1001	0.1750
		0.08	0.1019	0.1839
		0.32	0.1017	0.1864
	1:2	0	0.2101	0.3573
		0.08	0.2119	0.3663
		0.32	0.2117	0.3688
	4:1	0	0.3101	0.4907
		0.08	0.3219	0.4991
		0.32	0.3317	0.4012
1.75/3.75	1:1	0	0.1001	0.1325
		0.08	0.1019	0.1421
		0.32	0.1017	0.1448
	1:2	0	0.3101	0.4887
		0.08	0.3119	0.4992
		0.32	0.3117	0.4023
	4:1	0	0.3801	0.5748
		0.08	0.3819	0.5851
		0.32	0.3917	0.5879

Table 5. Efficiency of the Effect Sizes Metrics under Fixed-Effects Assumptions ($\tau^2 = 0$).

Normality	*δ*	*n*	*SMD*	*UMD*
0/3	0.25	30	0.1104	0.1108
		50	0.0492	0.0500
		80	0.0276	0.0281
	0.5	30	0.1104	0.1109
		50	0.0492	0.0500
		80	0.0276	0.0282
	0.8	30	0.1104	0.1106
		50	0.0492	0.0499
		80	0.0276	0.0281
0.75/0	0.25	30	0.1868	0.2117
		50	0.0718	0.1504
		80	0.0690	0.1284
	0.5	30	0.1868	0.2131
		50	0.0718	0.1510
		80	0.0690	0.1287
	0.8	30	0.1868	0.2137
		50	0.0718	0.1513
		80	0.0690	0.1289
1.75/3.75	0.25	30	0.2286	0.3126
		50	0.1568	0.2508
		80	0.1318	0.2286
	0.5	30	0.2286	0.3157
		50	0.1568	0.2522
		80	0.1318	0.2294
	0.8	30	0.2286	0.3177
		50	0.1568	0.2531
		80	0.1318	0.2299

Table 6. Efficiency of Effect Sizes Indexes under Random-Effects Assumptions ($\tau^2 = 0.08$).

Normality	*δ*	*n*	*SMD*	*UMD*
0/3	0.25	30	0.1104	0.1118
		50	0.0492	0.0505
		80	0.0276	0.0284
	0.5	30	0.1104	0.1117
		50	0.0492	0.0504
		80	0.0276	0.0284
	0.8	30	0.1104	0.1112
		50	0.0492	0.0502
		80	0.0276	0.0283
0.75/0	0.25	30	0.1867	0.2127
		50	0.0718	0.1509
		80	0.0690	0.1286
	0.5	30	0.1867	0.2139
		50	0.0718	0.1514
		80	0.0690	0.1289
	0.8	30	0.1867	0.2143
		50	0.0718	0.1516
		80	0.0690	0.1290
1.75/3.75	0.25	30	0.2286	0.3136
		50	0.1568	0.2513
		80	0.1318	0.2289
	0.5	30	0.2286	0.3165
		50	0.1568	0.2526
		80	0.1318	0.2296
	0.8	30	0.2286	0.3183
		50	0.1568	0.2534
		80	0.1318	0.2301

Table 7. Efficiency of the Effect Sizes Indexes under Random Effects Assumptions(τ^2 = 0.32).

Normality	*δ*	*n*	*SMD*	*UMD*
0/3	0.25	30	0.0552	0.1149
		50	0.0246	0.0519
		80	0.0138	0.0292
	0.5	30	0.0552	0.1143
		50	0.0246	0.0516
		80	0.0138	0.0290
	0.8	30	0.0552	0.1132
		50	0.0246	0.0511
		80	0.0138	0.0288
0.75/0	0.25	30	0.0983	0.2158
		50	0.0759	0.1523
		80	0.0445	0.1294
	0.5	30	0.0983	0.2165
		50	0.0759	0.1526
		80	0.0445	0.1296
	0.8	30	0.0983	0.2162
		50	0.0759	0.1525
		80	0.0445	0.1295
1.75/3.75	0.25	30	0.1642	0.3167
		50	0.1284	0.2527
		80	0.1159	0.2297
	0.5	30	0.1642	0.3191
		50	0.1284	0.2538
		80	0.1159	0.2303
	0.8	30	0.1642	0.3202
		50	0.1284	0.2543
		80	0.1159	0.2306

Table 8. Efficiency of the Effect Sizes Metrics as a Function of Deviations from Normality, Heteroskedasticity, and Between-Studies Variance.

Normality	*Heteroskedastic*	τ^2	*SMD*	*UMD*
0/3	1:1	0	0.0001	0.0175
		0.08	0.0019	0.0257
		0.32	0.0017	0.0279
	1:2	0	0.0001	0.0259
		0.08	0.0019	0.0334
		0.32	0.0017	0.0353
	4:1	0	0.0001	0.0066
		0.08	0.0019	0.0131
		0.32	0.0017	0.0146
0.75/0	1:1	0	0.0111	0.0750
		0.08	0.0119	0.0839
		0.32	0.0117	0.0864
	1:2	0	0.0101	0.1573
		0.08	0.0119	0.1663
		0.32	0.0117	0.1688
	4:1	0	0.0101	0.1907
		0.08	0.0119	0.1991
		0.32	0.0117	0.2012
1.75/3.75	1:1	0	0.0180	0.1325
		0.08	0.0216	0.1421
		0.32	0.0225	0.1448
	1:2	0	0.0180	0.2887
		0.08	0.0216	0.2992
		0.32	0.0225	0.3023
	4:1	0	0.0180	0.3748
		0.08	0.0216	0.3851
		0.32	0.0225	0.3879

Appendix B. Bias, Efficiency, and Theoretical Variance for All Effect Size Indexes and Their Variances

This appendix provides detailed tables for the results of the specific aim 2, including the bias, efficiency, and theoretical variance adjusted for all the effect size indexes and their variances.

Table 9. Correspondence of Raw-Score Parametric Effect Size, δ_{raw} = 0.5 (σ_{raw} = 1) in with Change-Score Metrics.

ρ	0	.25	.30	.45	.50	.65	.75	.80
σ_{ch}	1.41	1.22	1.18	1.045	1	0.83	0.70	0.63
δ_{ch}	0.35	0.41	0.42	0.48	0.50	0.60	0.71	0.79

Note. ρ = parametric correlation between pre- and post-test. σ_{ch} = parametric standard deviation of the parametric change-metric effect size. δ_{ch} = parametric change-metric effect size.

Table 10. Descriptive Statistics for a Hypothetical Study Using a One-Group Design with Repeated Measures between Pretest and Posttest.

$\overline{Y}_{Pre}$	S_{Pre}	$\overline{Y}_{Post}$	S_{Post}	$\overline{Y}_{Diff}$	S_{Diff}	t_d	$r_{pre,post}$
2.45	1.00	3.03	0.99	0.58	0.87	6.62	.61

Note. $r_{pre,post}$ = Correlation between pre- and post-test. S_{Diff} = Standard deviation of the differences. S_{Pre} *and* S_{Post} = Standard deviations of the pretest and posttest, respectively. t_d = *t*-test for dependent samples. $\overline{Y}_{Diff}$ = mean of the differences. $\overline{Y}_{Pre}$ and $\overline{Y}_{Post}$ = Means of the pretest and posttest, respectively.

Table 11. Descriptive Statistics for a Hypothetical Study using a Two-Group Design with Repeated Measures between Pretest and Posttest.

	$\overline{Y}_{Pre}$	S_{Pre}	$\overline{Y}_{Post}$	S_{Post}	$\overline{Y}_{Diff}$	S_{Diff}	t_d	$r_{pre,post}$	MSE_b	MSE_w	MSE_a	$r_{within\text{-}class}$
Control	2.45	1.00	2.48	0.99	0.03	0.87	0.33	.61	1.60	0.38	15.13	.49
Experimental	2.45	1.00	3.03	0.99	0.58	0.87	6.62	.61				

Note. MSE_b = Mean-square error between groups. MSE_w = Mean-square error within (i.e., for repeated measures). MSE_a = Adjusted mean square error from the covariance analysis. $r_{w\text{-}class}$ = Within-class correlation. Other terms are defined in Table 10.

Table 12. Comparison of Pretest and Posttest Means for the Experimental Group (Table 11), Assuming that the Observations Derive from Two Independent Groups.

Hedges's $d = \frac{\overline{Y}_{Pre} - \overline{Y}_{Post}}{S_{Pooled}} = \frac{3.03 - 2.45}{1} = 0.5796$

$$c(n-1) = 1 - \frac{3}{4(n-1)-1} = 1 - \frac{3}{4(100-1)-1} = 0.99$$

$$S_{Pooled} = \sqrt{\frac{(n_E - 1)S_{Pre}^2 + (n_C - 1)S_{Post}^2}{n_{Pre} + n_{Post} - 2}} = \sqrt{\frac{(100-1)0.99 + (100-1)1}{100 + 100 - 2}} = 1$$

Table 13. Standardized Mean Difference ES Estimations for a One-Group Repeated-Measures Design and Illustrated with Table 10's Data.

Source	Equation and result
Glass (1981)	$d = t_d \sqrt{\frac{1}{n} 2(1 - r_{pre,post})} = 6.62 \sqrt{\frac{1}{100} 2(1 - 0.61)} = 0.5817$
Rosenthal (1984)	$d = t_d \sqrt{\frac{1}{n_l}} = 6.62 \sqrt{\frac{1}{100}} = 0.6620$ $t_d = \frac{\overline{Y}_{Diff}}{S_{Diff}} \sqrt{n} = \frac{0.58}{0.87} \sqrt{100} = 6.62$
Becker (1988)	$d = c(n-1) \frac{\overline{Y}_{Post} - \overline{Y}_{Pre}}{S_{Pre}} = \frac{3.03 - 2.45}{1} = 0.5721$ $c(n-1) = 1 - \frac{3}{4(n-1)-1} = 1 - \frac{3}{4(100-1)-1} = 0.99$
Gibbons et al. (1996)	$d = c(n-1) \frac{\overline{Y}_{Diff}}{S_{Diff}} = 0.99 \frac{0.58}{0.87} = 0.6569$
Huedo-Medina & Johnson	$d = c(n-1) \frac{\overline{Y}_{Post} - \overline{Y}_{Pre}}{S_{within-pool}} = 0.99 \frac{3.03 - 2.45}{1.41} = 0.4082$

Note. $S_{\text{within-pool}}$ = Repeated measures pooled standard deviation.

Table 14. Standardized Mean Difference ES Estimations for Two Independent Groups.

Source	Equation and result
Hedges (1981)	$d = c(N-2)\frac{\overline{Y}^{E}_{Post} - \overline{Y}^{C}_{Post}}{S_{Pooled}} = 0.996\frac{3.03-2.48}{0.99} = 0.5556$ $S_{Pooled} = \sqrt{\frac{(n_E-1)S_E^2 + (n_C-1)S_C^2}{n_E+n_C-2}} = \sqrt{\frac{(100-1)0.99+(100-1)0.99}{100+100-2}} = 0.99$ $c(N-1) = 1 - \frac{3}{4(N-2)-1} = 1 - \frac{3}{4(200-2)-1} = 0.996$
Becker (1988)	$d = c(n-1)\left[\frac{\overline{Y}^{E}_{Post} - \overline{Y}^{E}_{Pre}}{S^{E}_{Pre}} - \frac{\overline{Y}^{C}_{Post} - \overline{Y}^{C}_{Pre}}{S^{C}_{Pre}}\right] = 0.99\left[\frac{3.03-2.45}{1} - \frac{2.48-2.45}{1}\right] = 0.5434$
Gibbons et al. (1996)	$d = c(n-1)\left[\frac{\overline{Y}^{E}_{Diff}}{S^{E}_{Diff}} - \frac{\overline{Y}^{C}_{Diff}}{S^{C}_{Diff}}\right] = 0.99\left[\frac{0.58}{0.87} - \frac{0.03}{0.87}\right] = 0.6240$
New approach	$d = c(n-1)\left[\frac{\overline{Y}^{E}_{Post} - \overline{Y}^{E}_{Pre}}{S^{E}_{within-pool}} - \frac{\overline{Y}^{C}_{Post} - \overline{Y}^{C}_{Pre}}{S^{C}_{within-pool}}\right] = 0.99\left[\frac{3.03-2.45}{1.41} - \frac{2.48-2.45}{1.41}\right] = 0.3877$
Shadish et al. (1999)	$d_1 = \frac{\overline{Y}^{E}_{Post} - \overline{Y}^{C}_{Post}}{S_{Pooled}} = \frac{3.03-2.48}{1} = 0.5525$ $S_E = \frac{\lvert \overline{Y}^{E}_{Pre} - \overline{Y}^{E}_{Post} \rvert \sqrt{n_l}}{\lvert t^{E}_{d} \rvert \sqrt{2(1-r^{E}_{pre,post})}} = \frac{\lvert 2.45-3.03 \rvert \sqrt{100}}{\lvert 6.62 \rvert \sqrt{2(1-0.61)}} = 1,\ S_C = \frac{\lvert 2.45-2.48 \rvert \sqrt{100}}{\lvert 0.33 \rvert \sqrt{2(1-0.61)}} = 1$
Shadish et al. (1999)	$d_2 = \frac{\overline{Y}^{E}_{Post} - \overline{Y}^{C}_{Post}}{S_{ANOVA}} = \frac{3.03-2.48}{1} = 0.5526$ $S_{ANOVA} = \sqrt{\frac{MSEb + (tp-1)MSEw}{tp}} = \sqrt{\frac{1.60+(2-1)0.38}{2}} = 1$

Source	Equation and result
Shadish et al. (1999)	$d_3 = \frac{\overline{Y}^{E}_{Post} - \overline{Y}^{C}_{Post}}{S_{ANCOVA}} = \frac{3.03 - 2.48}{1.23} = 0.4470$ $S_{\text{ANCOVA}} = \sqrt{\frac{MSEa(N-h-1)}{(1-r^2_{w-class})(N-h)}} = \sqrt{\frac{15.13(200-2-1)}{(1-0.49)(200-2)}} = 1.23$

Table 15. Estimates of Sampling Variance for a One-Group Within-Subjects Design, Illustrated with Data from Table 10

Metric	Equation and result
Raw score (Becker, 1988)	$\mathrm{var}_{one-g}(d_b) = \left(\frac{2\left(1-r_{pre,post}\right)}{n}\right)\left(\frac{n-1}{n-3}\right)\left(1+\frac{n}{2\left(1-r_{pre,post}\right)}d_b^2\right)-\frac{d_b^2}{\left[c\left(100-1\right)\right]^2} =$ $\left(\frac{2\left(1-0.61\right)}{100}\right)\left(\frac{100-1}{100-3}\right)\left(1+\frac{100}{2\left(1-0.61\right)}0.5721\right)-\frac{0.5721}{\left(0.99\right)^2} = 0.0096$
Change score (Gibbons et al., 1993)	$\mathrm{var}_{one-g}(d_g) = \left(\frac{1}{n}\right)\left(\frac{n-1}{n-3}\right)\left(1+nd_g^2\right)-\frac{d_g^2}{\left[c\left(n-1\right)\right]^2} =$ $\left(\frac{1}{100}\right)\left(\frac{100-1}{100-3}\right)\left(1+100\times 0.6569\right)-\frac{0.6569}{\left(0.99\right)^2} = 0.0125$

Note. The correction term, *c*, is defined in Table 13.

Table 16. Estimates of Sampling Variances for Two-Group Designs with Repeated Measures.

Variance estimate	Equation and result
Raw-score metric for a total ES (Hedges, 1981)	$\mathrm{var}_{two-g}(d_{b_t}) = \left(\frac{1}{\tilde{n}}\right)\left(\frac{N-2}{N-4}\right)\left(1+\tilde{n}d_{b_t}^2\right) - \frac{d_{b_t}^2}{\left[c\left(N-2\right)\right]^2} =$ $\left(\frac{1}{50}\right)\left(\frac{200-2}{200-4}\right)\left(1+50\cdot 0.5434\right) - \frac{0.5434}{\left(0.996\right)^2} = 0.0210$ $\tilde{n} = \frac{n_E * n_C}{n_E + n_C} = \frac{100*100}{100+100} = 50$
Raw-score metric for a function of two ESs (Becker, 1988)	$\mathrm{var}_{two-g}(d_b) = \mathrm{var}_{one-g}(d_b^E) + \mathrm{var}_{one-g}(d_b^C) = 0.0096 + 0.0079 = 0.0175$
Change-score metric for a total ES (Morris & DeShon, 2002)	$\mathrm{var}_{two-g}(d_{g_t}) = \left(\frac{1}{2\left(1-r_{pre,post}^E\right)\tilde{n}}\right)\left(\frac{N-2}{N-4}\right)\left(1+2\left(1-r_{pre,post}^E\right)\tilde{n}d_{g_t}^2\right) - \frac{d_{g_t}^2}{\left[c\left(N-2\right)\right]^2} =$ $\left(\frac{1}{2\left(1-0.61\right)50}\right)\left(\frac{200-2}{200-4}\right)\left(1+2\left(1-0.61\right)50\times 0.6240\right) - \frac{0.6240}{\left(0.996\right)^2} = 0.0272$
Change-score metric for a function of two ESs (Morris & DeShon, 2002)	$\mathrm{var}_{two-g}(d_g) = \mathrm{var}_{one-g}(d_g^E) + \mathrm{var}_{one-g}^C(d_g^C) = 0.0125 + 0.0102 = 0.0227$

Table 17. Bias of Repeated Measures ES Indexes under Differing Sample Sizes (*n*) and Correlations (r) between the Pretest and Posttest.

n	*r*	d_{hb}	d_{hw}	d_{tra}	d_{tch}	d_b	d_g
50	.00	0.0001	-0.1491	0.0074	-0.1412	-0.0004	-0.1467
	.25	-0.0007	-0.1497	0.0059	-0.0869	-0.0010	-0.0933
	.50	0.0019	-0.1478	0.0084	0.0084	0.0010	0.0006
	.75	0.0034	-0.1468	0.0084	0.3038	0.0009	0.2914
75	.00	0.0010	-0.1475	0.0066	-0.1418	0.0011	-0.1454
	.25	0.0002	-0.1481	0.0052	-0.0875	-0.0002	-0.0917
	.50	-0.0005	-0.1486	0.0040	0.0040	-0.0009	-0.0011
	.75	0.0017	-0.1471	0.0048	0.2982	0.0001	0.2901
100	.00	0.0012	-0.1469	0.0051	-0.1428	0.0011	-0.1455
	.25	0.0004	-0.1475	0.0034	-0.0890	0.0003	-0.0921
	.50	-0.0003	-0.1480	0.0031	0.0031	-0.0006	-0.0007
	.75	0.0020	-0.1464	0.0043	0.2974	0.0008	0.2913
250	.00	0.0001	-0.1469	0.0014	-0.1455	0.0002	-0.1465
	.25	0.0003	-0.1467	0.0016	-0.0904	0.0004	-0.0916
	.50	-0.0004	-0.1473	0.0010	0.0010	-0.0007	-0.0005
	.75	0.0001	-0.1469	0.0014	0.2928	-0.0005	0.2904
500	.00	0.0002	-0.1466	0.0011	-0.1457	0.0005	-0.1462
	.25	0.0010	-0.1460	0.0018	-0.0903	0.0010	-0.0909
	.50	0.0003	-0.1465	0.0014	0.0014	0.0000	0.0006
	.75	0.0000	-0.1467	0.0005	0.2913	-0.0005	0.2902
750	.00	-0.0001	-0.1467	0.0003	-0.1462	0.0000	-0.1466
	.25	-0.0006	-0.1470	-0.0001	-0.0918	-0.0008	-0.0923
	.50	0.0002	-0.1465	0.0005	0.0005	0.0001	0.0000
	.75	0.0007	-0.1461	0.0008	0.2919	0.0006	0.2911

Note. Bias is defined as the *M* difference between the Monte Carlo simulation's 10,000 replications and the parametric value. See Table 12 and 13 for definition of the ES indexes.

Table 18. Bias for Repeated Measures ES Indexes as a Function of the Correlations (r) between Pretest and Posttest.

r	d_{hb}	d_{hw}	d_{tra}	d_{tch}	d_b	d_g
.00	0.0004	-0.1473	0.0037	-0.1439	0.0037	-0.1462
.25	0.0001	-0.1475	0.0030	-0.0893	0.0032	-0.0920
.50	0.0002	-0.1475	0.0031	0.0031	0.0031	-0.0002
.75	0.0013	-0.1467	0.0034	0.2959	0.0035	0.2908

Note. See Table 12 and 13 for definition of the ES indexes.

Table 19. Mean Square Error (MSE) of the ES Indexes under Differing Sample Sizes (n) and Correlations (r) between the Pretest and Posttest.

n	r	d_{hb}	d_{hw}	d_{tra}	d_{tch}	d_b	d_g
50	.00	0.0419	0.0429	0.0449	0.0423	0.0446	0.0432
	.25	0.0308	0.0376	0.0333	0.0298	0.0331	0.0302
	.50	0.0215	0.0324	0.0231	0.0231	0.0234	0.0223
	.75	0.0103	0.0266	0.0110	0.1197	0.0111	0.1115
75	.00	0.0272	0.0352	0.0289	0.0345	0.0288	0.0353
	.25	0.0212	0.0325	0.0226	0.0227	0.0226	0.0232
	.50	0.0148	0.0294	0.0159	0.0159	0.0158	0.0155
	.75	0.0067	0.0250	0.0071	0.1066	0.0072	0.1014
100	.00	0.0204	0.0317	0.0215	0.0312	0.0214	0.0318
	.25	0.0160	0.0297	0.0168	0.0191	0.0170	0.0195
	.50	0.0107	0.0272	0.0115	0.0115	0.0115	0.0113
	.75	0.0051	0.0240	0.0053	0.1016	0.0054	0.0978
250	.00	0.0081	0.0256	0.0084	0.0254	0.0084	0.0256
	.25	0.0062	0.0246	0.0065	0.0125	0.0065	0.0127
	.50	0.0044	0.0239	0.0046	0.0046	0.0046	0.0046
	.75	0.0021	0.0226	0.0021	0.0910	0.0022	0.0896
500	.00	0.0041	0.0235	0.0042	0.0233	0.0042	0.0235
	.25	0.0032	0.0229	0.0034	0.0104	0.0034	0.0105
	.50	0.0021	0.0225	0.0023	0.0023	0.0022	0.0023
	.75	0.0010	0.0220	0.0010	0.0875	0.0010	0.0868
750	.00	0.0027	0.0229	0.0028	0.0228	0.0028	0.0229
	.25	0.0021	0.0227	0.0022	0.0099	0.0022	0.0100
	.50	0.0015	0.0222	0.0015	0.0015	0.0015	0.0015
	.75	0.0007	0.0217	0.0007	0.0870	0.0007	0.0865

Note. See Table 12 and 13 for definition of the ES indexes.

Table 20. Mean Square Error (MSE) of the ES Indexes as a Function of the Correlation(r) between Pretest and Posttest.

r	d_{hb}	d_{hw}	d_{tra}	d_{tch}	d_b	d_g
.00	0.0174	0.0303	0.0185	0.0299	0.0184	0.0304
.25	0.0133	0.0283	0.0141	0.0174	0.0141	0.0177
.50	0.0092	0.0263	0.0098	0.0098	0.0098	0.0096
.75	0.0043	0.0237	0.0045	0.0989	0.0046	0.0956

Note. See Table 12 and 13 for definition of the ES indexes.

Table 21. Efficiency of the ES Indexes under Differing Sample Sizes (n) and Correlations (r) between the Pretest and Posttest.

n	r	d_{hb}	d_{hw}	d_{tra}	d_{tch}	d_b	d_g
50	.00	0.0413	0.0206	0.0426	0.0224	0.0432	0.0217
	.25	0.0303	0.0152	0.0312	0.0222	0.0321	0.0215
	.50	0.0212	0.0106	0.0217	0.0230	0.0226	0.0223
	.75	0.0101	0.0051	0.0103	0.0274	0.0107	0.0266
75	.00	0.0269	0.0135	0.0275	0.0144	0.0282	0.0141
	.25	0.0210	0.0105	0.0214	0.0151	0.0221	0.0147
	.50	0.0146	0.0073	0.0149	0.0158	0.0155	0.0155
	.75	0.0066	0.0033	0.0067	0.0176	0.0070	0.0173
100	.00	0.0202	0.0101	0.0206	0.0108	0.0210	0.0106
	.25	0.0159	0.0079	0.0161	0.0112	0.0167	0.0110
	.50	0.0106	0.0053	0.0108	0.0115	0.0113	0.0113
	.75	0.0051	0.0025	0.0051	0.0131	0.0053	0.0129
250	.00	0.0081	0.0040	0.0081	0.0042	0.0083	0.0042
	.25	0.0062	0.0031	0.0062	0.0043	0.0065	0.0043
	.50	0.0043	0.0022	0.0044	0.0046	0.0045	0.0046
	.75	0.0021	0.0010	0.0021	0.0053	0.0021	0.0053
500	.00	0.0041	0.0020	0.0041	0.0021	0.0042	0.0021
	.25	0.0032	0.0016	0.0032	0.0023	0.0034	0.0022
	.50	0.0021	0.0011	0.0021	0.0023	0.0022	0.0023
	.75	0.0010	0.0005	0.0010	0.0026	0.0010	0.0026
750	.00	0.0027	0.0013	0.0027	0.0014	0.0028	0.0014
	.25	0.0021	0.0011	0.0021	0.0015	0.0022	0.0015
	.50	0.0015	0.0007	0.0015	0.0015	0.0015	0.0015
	.75	0.0007	0.0003	0.0007	0.0018	0.0007	0.0018

Note. See Table 12 and 13 for definition of the ES indexes.

Table 22. Efficiency for the ES Indexes as a Function of the Correlation (r) between Pretest and Posttest.

r	d_{hb}	d_{hw}	d_{tra}	d_{tch}	d_b	d_g
.00	0.0172	0.0086	0.0176	0.0092	0.0180	0.0090
.25	0.0131	0.0066	0.0134	0.0094	0.0138	0.0092
.50	0.0091	0.0045	0.0092	0.0098	0.0096	0.0096
.75	0.0043	0.0021	0.0043	0.0113	0.0045	0.0111

Note. See Table 12 and 13 for definition of the ES indexes.

Table 23. T*heoretical Variance Adjustment to the Empirical Variance under Differing Sample Sizes (*n*) and Correlations (*r*) between the Pretest and Posttest*.

n	r	d_{hb}	d_{hw}	d_b	d_g
50	.00	0.0375	0.0226	0.0018	0.0217
	.25	0.0284	0.0176	0.0023	0.0120
	.50	0.0171	0.0118	0.0013	0.0017
	.75	0.0037	0.0047	0.0005	-0.0102
75	.00	0.0252	0.0149	0.0012	0.0142
	.25	0.0177	0.0110	0.0004	0.0071
	.50	0.0107	0.0073	0.0001	0.0001
	.75	0.0025	0.0031	0.0003	-0.0067
100	.00	0.0188	0.0110	0.0008	0.0105
	.25	0.0132	0.0081	0.0000	0.0053
	.50	0.0083	0.0056	0.0003	0.0003
	.75	0.0018	0.0022	0.0001	-0.0051
250	.00	0.0075	0.0043	0.0002	0.0042
	.25	0.0054	0.0032	0.0001	0.0021
	.50	0.0032	0.0021	0.0000	0.0000
	.75	0.0007	0.0008	0.0000	-0.0022
500	.00	0.0037	0.0021	0.0001	0.0020
	.25	0.0025	0.0015	-0.0001	0.0009
	.50	0.0016	0.0011	0.0000	0.0000
	.75	0.0004	0.0004	0.0000	-0.0011
750	.00	0.0025	0.0014	0.0001	0.0014
	.25	0.0017	0.0010	0.0000	0.0006
	.50	0.0011	0.0007	0.0000	0.0000
	.75	0.0002	0.0003	0.0000	-0.0008

Note. See Table 12 and 13 for definition of the ES indexes.

Table 24. Theoretical Variance Adjustment to the Empirical Variance as a Function of the Correlation (r) between Pretest and Posttest.

r	d_{hb}	d_{hw}	d_{hw_nonr}	d_b	d_{b_nonr}	d_g
.00	0.0159	0.0094	0.0007	0.0007	-0.0080	0.0003
.25	0.0115	0.0071	0.0028	0.0005	-0.0039	0.0003
.50	0.0070	0.0048	0.0048	0.0003	0.0003	0.0003
.75	0.0016	0.0019	0.0071	0.0002	0.0054	0.0005

Note. d_{hw_nonr}=Hedges' standardized mean difference using the within-study degrees of freedom without including the correlation factor $2(1 - r)$. d_{b_nonr}= Becker's standardized mean difference without including the correlation factor $2(1 - r)$. See Table 12 and 13 for definition of the other ES indexes.

Table 25. Bias of the ES Indexes as a Function of Sample Size (n) and the Correlation (r) between Pretest and Posttest.

n	r	d_{hb}	d_{hw}	d_b	d_g	d_{s1}	d_{s2}	d_{s3}
50	.00	0.0042	-0.1492	-0.0004	-0.1467	0.0037	0.0038	-0.1191
	.25	0.0041	-0.149	0.0000	-0.0927	0.0033	0.0041	-0.1143
	.50	0.0036	-0.1487	-0.0002	-0.0006	0.0025	0.0045	-0.0977
	.75	0.0041	-0.1473	0.0003	0.2906	0.0029	0.0066	-0.0527
75	.00	0.0022	-0.1485	-0.0003	-0.1464	0.0022	0.0023	-0.1288
	.25	0.0028	-0.1481	-0.0003	-0.0917	0.0022	0.0028	-0.1230
	.50	0.0023	-0.1479	0.0001	-0.0001	0.0018	0.0031	-0.1059
	.75	0.0026	-0.1471	0.0001	0.2902	0.0018	0.0042	-0.0590
100	.00	0.0020	-0.1477	0.0002	-0.1463	0.0021	0.0021	-0.1330
	.25	0.0023	-0.1475	0.0002	-0.0920	0.0019	0.0023	-0.1274
	.50	0.0017	-0.1475	0.0001	0.0000	0.0013	0.0023	-0.1099
	.75	0.0018	-0.1470	0.0000	0.2903	0.0012	0.0031	-0.0621
250	.00	0.0007	-0.1470	0.0001	-0.1466	0.0007	0.0007	-0.1412
	.25	0.0010	-0.1467	0.0005	-0.0916	0.0010	0.0012	-0.1354
	.50	0.0006	-0.1470	-0.0003	-0.0002	0.0003	0.0007	-0.1173
	.75	0.0007	-0.1468	-0.0003	0.2908	0.0003	0.0011	-0.0676
500	.00	0.0000	-0.1468	0.0002	-0.1464	0.0003	0.0003	-0.1441
	.25	0.0004	-0.1466	0.0002	-0.0916	0.0004	0.0005	-0.1381
	.50	0.0005	-0.1467	-0.0002	0.0004	0.0002	0.0004	-0.1194
	.75	0.0005	-0.1466	-0.0003	0.2905	0.0002	0.0005	-0.0693
750	.00	0.0002	-0.1466	0.0001	-0.1464	0.0003	0.0003	-0.1447
	.25	0.0005	-0.1466	-0.0001	-0.0917	0.0003	0.0003	-0.1389
	.50	0.0003	-0.1466	0.0000	-0.0002	0.0002	0.0003	-0.1204
	.75	0.0004	-0.1464	0.0001	0.2904	0.0003	0.0005	-0.0700

Note. See Table 21 for the definition of the ES indexes.

Table 26. Bias of the ES Indexes as a Function of the Correlation (r) between Pretest and Posttest.

r	d_{hb}	d_{hw}	d_b	d_g	d_{s1}	d_{s2}	d_{s3}
.00	0.0016	-0.1476	0.0000	-0.1465	0.0016	0.0016	-0.1352
.25	0.0019	-0.1474	0.0001	-0.0919	0.0015	0.0019	-0.1295
.50	0.0015	-0.1474	-0.0001	-0.0001	0.0011	0.0019	-0.1118
.75	0.0017	-0.1469	0.0000	0.2905	0.0011	0.0027	-0.0635

Note. d_{s1}= standardized mean difference using the Shadish's pool standard deviation. d_{s2}= the standardized mean difference from the ANOVA data. d_{s3}= standardized mean difference from ANCOVA data. See Tables 12 and 13 for definition of the other ES indexes.

Table 27. MSE of the ES Indexes under Differing Sample Sizes (n) and Correlations (r) between the Pretest and Posttest.

n	*r*	d_{hb}	d_{hw}	d_b	d_g	d_{s1}	d_{s2}	d_{s3}
50	.00	0.0029	0.0028	0.0027	0.0229	0.0013	0.0013	0.0158
	.25	0.0029	0.0028	0.0027	0.0103	0.0014	0.0014	0.0146
	.50	0.0027	0.0027	0.0027	0.0026	0.0017	0.0017	0.0110
	.75	0.0028	0.0027	0.0027	0.0912	0.0022	0.0023	0.0044
75	.00	0.0018	0.0018	0.0017	0.0223	0.0009	0.0009	0.0175
	.25	0.0018	0.0018	0.0017	0.0095	0.0009	0.0009	0.0161
	.50	0.0018	0.0018	0.0017	0.0017	0.0011	0.0011	0.0122
	.75	0.0018	0.0018	0.0018	0.0887	0.0014	0.0015	0.0045
100	.00	0.0013	0.0013	0.0013	0.0221	0.0006	0.0006	0.0184
	.25	0.0013	0.0013	0.0013	0.0093	0.0007	0.0007	0.0169
	.50	0.0013	0.0013	0.0013	0.0013	0.0008	0.0008	0.0128
	.75	0.0013	0.0013	0.0013	0.0875	0.0010	0.0010	0.0046
250	.00	0.0005	0.0005	0.0005	0.0218	0.0003	0.0003	0.0202
	.25	0.0005	0.0005	0.0005	0.0087	0.0003	0.0003	0.0186
	.50	0.0005	0.0005	0.0005	0.0005	0.0003	0.0003	0.0140
	.75	0.0005	0.0005	0.0005	0.0858	0.0004	0.0004	0.0048
500	.00	0.0003	0.0003	0.0003	0.0216	0.0001	0.0001	0.0209
	.25	0.0002	0.0002	0.0003	0.0086	0.0001	0.0001	0.0192
	.50	0.0003	0.0003	0.0002	0.0003	0.0002	0.0002	0.0144
	.75	0.0002	0.0002	0.0003	0.0850	0.0002	0.0002	0.0049
750	.00	0.0002	0.0002	0.0002	0.0215	0.0001	0.0001	0.0210
	.25	0.0002	0.0002	0.0002	0.0085	0.0001	0.0001	0.0194
	.50	0.0002	0.0002	0.0002	0.0002	0.0001	0.0001	0.0146
	.75	0.0002	0.0002	0.0002	0.0848	0.0001	0.0001	0.0050

Note. See Tables 12, 13, and 21 for definition of ESs.

Table 28. MSE for the ES Ondexes as a function of the correlation.

r	d_{hb}	d_{hw}	d_b	d_g	d_{s1}	d_{s2}	d_{s3}
.00	0.0012	0.0012	0.0011	0.0220	0.0006	0.0006	0.0190
.25	0.0012	0.0011	0.0011	0.0092	0.0006	0.0006	0.0175
.50	0.0011	0.0011	0.0011	0.0011	0.0007	0.0007	0.0132
.75	0.0011	0.0011	0.0011	0.0872	0.0009	0.0009	0.0047

Note. See Tables 12, 13 and 21 for definition of ES indexes.

Table 29. Efficiency of the ES indexes as a Function of Sample Size (n) and the Correlation (r) between Pretest and Posttest.

n	*r*	d_{hb}	d_{hw}	d_b	d_g	d_{s1}	d_{s2}	d_{s3}
50	.00	0.0027	0.0006	0.0027	0.0013	0.0013	0.0013	0.0016
	.25	0.0028	0.0007	0.0027	0.0017	0.0014	0.0014	0.0016
	.50	0.0026	0.0008	0.0027	0.0026	0.0017	0.0017	0.0015
	.75	0.0027	0.0011	0.0027	0.0068	0.0022	0.0022	0.0017
75	.00	0.0018	0.0004	0.0017	0.0009	0.0009	0.0009	0.0010
	.25	0.0018	0.0004	0.0017	0.0011	0.0009	0.0009	0.0010
	.50	0.0017	0.0005	0.0017	0.0017	0.0011	0.0011	0.0009
	.75	0.0018	0.0007	0.0018	0.0044	0.0014	0.0014	0.0010
100	.00	0.0013	0.0003	0.0013	0.0006	0.0006	0.0006	0.0007
	.25	0.0013	0.0003	0.0013	0.0009	0.0007	0.0007	0.0007
	.50	0.0013	0.0004	0.0013	0.0013	0.0008	0.0008	0.0007
	.75	0.0013	0.0005	0.0013	0.0033	0.0010	0.0010	0.0007
250	.00	0.0005	0.0001	0.0005	0.0003	0.0003	0.0003	0.0003
	.25	0.0005	0.0001	0.0005	0.0003	0.0003	0.0003	0.0003
	.50	0.0005	0.0002	0.0005	0.0005	0.0003	0.0003	0.0003
	.75	0.0005	0.0002	0.0005	0.0013	0.0004	0.0004	0.0003
500	.00	0.0003	0.0001	0.0003	0.0001	0.0001	0.0001	0.0001
	.25	0.0002	0.0001	0.0003	0.0002	0.0001	0.0001	0.0001
	.50	0.0003	0.0001	0.0002	0.0003	0.0002	0.0002	0.0001
	.75	0.0002	0.0001	0.0003	0.0006	0.0002	0.0002	0.0001
750	.00	0.0002	0.0000	0.0002	0.0001	0.0001	0.0001	0.0001
	.25	0.0002	0.0000	0.0002	0.0001	0.0001	0.0001	0.0001
	.50	0.0002	0.0001	0.0002	0.0002	0.0001	0.0001	0.0001
	.75	0.0002	0.0001	0.0002	0.0004	0.0001	0.0001	0.0001

Note. See Tables 12, 13 and 21 for definition of ES indexes.

Table 30. Mean Efficiency for the ES Indexes as a Function of the Correlation (r) between Pretest and Posttest.

r	d_{hb}	d_{hw}	d_b	d_g	d_{s1}	d_{s2}	d_{s3}
.00	0.0011	0.0003	0.0011	0.0006	0.0006	0.0006	0.0006
.25	0.0011	0.0003	0.0011	0.0007	0.0006	0.0006	0.0006
.50	0.0011	0.0004	0.0011	0.0011	0.0007	0.0007	0.0006
.75	0.0011	0.0005	0.0011	0.0028	0.0009	0.0009	0.0007

Note. See Tables 12, 13 and 21 for definition of ES indexes.

Table 31. Theoretical Variance Adjustment to the Empirical Variance for those formulas that consider the ES a sum of two ES or as a Total ES.

n	*r*	d_{hb}	d_{hw}	d_{hw_total}	d_b	d_{b_total}	d_g	d_{g_total}	d_{s1}	d_{s3}
50	.00	0.0395	0.2800	0.0408	0.2581	0.0395	0.2367	0.0202	0.0409	0.0400
	.25	0.0394	0.2697	0.0408	0.2592	0.0395	0.2503	0.0271	0.0408	0.0401
	.50	0.0395	0.2603	0.0407	0.2600	0.0394	0.2601	0.0412	0.0405	0.0402
	.75	0.0395	0.2489	0.0404	0.2593	0.0395	0.2104	0.0818	0.0400	0.0402
75	.00	0.0262	0.2637	0.0270	0.2574	0.0262	0.2358	0.0133	0.0271	0.0266
	.25	0.0262	0.2550	0.0270	0.2549	0.0262	0.2468	0.0178	0.0270	0.0266
	.50	0.0262	0.2470	0.0269	0.2536	0.0262	0.2535	0.0269	0.0268	0.0266
	.75	0.0262	0.2414	0.0268	0.2557	0.0262	0.2095	0.0532	0.0265	0.0267
100	.00	0.0196	0.2549	0.0202	0.2556	0.0196	0.2340	0.0099	0.0202	0.0199
	.25	0.0196	0.2482	0.0202	0.2534	0.0196	0.2453	0.0132	0.0202	0.0199
	.50	0.0196	0.2426	0.0201	0.2534	0.0195	0.2532	0.0199	0.0200	0.0199
	.75	0.0196	0.2388	0.0200	0.2549	0.0196	0.2092	0.0394	0.0198	0.0200
250	.00	0.0078	0.2386	0.0080	0.2520	0.0078	0.2304	0.0039	0.0080	0.0079
	.25	0.0078	0.2364	0.0080	0.2516	0.0078	0.2433	0.0052	0.0080	0.0079
	.50	0.0078	0.2339	0.0080	0.2511	0.0078	0.2511	0.0078	0.0080	0.0079
	.75	0.0078	0.2320	0.0080	0.2513	0.0078	0.2072	0.0155	0.0079	0.0079
500	.00	0.0039	0.2337	0.0040	0.2511	0.0039	0.2297	0.0019	0.0040	0.0039
	.25	0.0039	0.2331	0.0040	0.2514	0.0039	0.2431	0.0026	0.0040	0.0039
	.50	0.0039	0.2316	0.0040	0.2510	0.0039	0.2510	0.0039	0.0040	0.004
	.75	0.0039	0.2302	0.0040	0.2506	0.0039	0.2072	0.0077	0.0039	0.004
750	.00	0.0026	0.2317	0.0027	0.2504	0.0026	0.2290	0.0013	0.0027	0.0026
	.25	0.0026	0.2305	0.0027	0.2498	0.0026	0.2415	0.0017	0.0027	0.0026
	.50	0.0026	0.2306	0.0027	0.2506	0.0026	0.2506	0.0026	0.0026	0.0026
	.75	0.0026	0.2302	0.0026	0.2510	0.0026	0.2077	0.0051	0.0026	0.0026

Note. *_total*= a variance calculated for a total ES, and *_total_nonr*= a variance calculated for a total ES without including it the correlation between the time measures. See Tables 12, 13 and 14 for definition of the other ES indexes.

Table 32. Mean of Theoretical Variance Adjustment to the Empirical Variance as a Function of the Correlation (r).

r	d_{hb}	d_{hw}	d_{hw_total}	d_{b}	d_{b_total}	d_{g}	d_{g_total}	d_{s1}	d_{s3}
.00	0.0166	0.2504	0.0171	0.2541	0.0166	0.2326	0.0169	0.0172	0.0168
.25	0.0166	0.2455	0.0171	0.2534	0.0166	0.2451	0.0168	0.0171	0.0168
.50	0.0166	0.2410	0.0171	0.2533	0.0166	0.2533	0.0166	0.0170	0.0169
.75	0.0166	0.2369	0.0170	0.2538	0.0166	0.2085	0.0155	0.0168	0.0169

Note. *_total*= a variance calculated for a total ES, and *_total_nonr*= a variance calculated for a total ES without including it the correlation between the time measures. See Tables 12 and 13 for definition of the other ES indexes.

Table 33. Theoretical Variance Adjustment to the Empirical Variance for those Formulas Considering the ES as a Total Value and Including or Excluding the Correlation (r) Factor into the Equation.

n	r	$d_{hw_total_r}$	$d_{hw_total_nonr}$	$d_{b_total_r}$	$d_{b_total_nonr}$	$d_{g_total_r}$	$d_{g_total_nonr}$
50	.00	0.0208	0.0408	0.0195	0.0395	0.0202	0.0402
	.25	0.0279	0.0408	0.0266	0.0395	0.0271	0.0400
	.50	0.0423	0.0407	0.0411	0.0394	0.0412	0.0396
	.75	0.0855	0.0404	0.0845	0.0395	0.0818	0.0368
75	.00	0.0137	0.0270	0.0129	0.0262	0.0133	0.0266
	.25	0.0184	0.0270	0.0176	0.0262	0.0178	0.0265
	.50	0.0277	0.0269	0.0269	0.0262	0.0269	0.0262
	.75	0.0556	0.0268	0.0550	0.0262	0.0532	0.0244
100	.00	0.0102	0.0202	0.0096	0.0196	0.0099	0.0199
	.25	0.0136	0.0202	0.0130	0.0196	0.0132	0.0198
	.50	0.0205	0.0201	0.0199	0.0195	0.0199	0.0195
	.75	0.0412	0.0200	0.0408	0.0196	0.0394	0.0182
250	.00	0.0040	0.0080	0.0038	0.0078	0.0039	0.0079
	.25	0.0054	0.0080	0.0051	0.0078	0.0052	0.0079
	.50	0.0081	0.0080	0.0078	0.0078	0.0078	0.0078
	.75	0.0162	0.0080	0.0160	0.0078	0.0155	0.0073
500	.00	0.0020	0.0040	0.0019	0.0039	0.0019	0.0039
	.25	0.0027	0.0040	0.0025	0.0039	0.0026	0.0039
	.50	0.0040	0.0040	0.0039	0.0039	0.0039	0.0039
	.75	0.0080	0.0040	0.0079	0.0039	0.0077	0.0036
750	.00	0.0013	0.0027	0.0013	0.0026	0.0013	0.0026
	.25	0.0018	0.0027	0.0017	0.0026	0.0017	0.0026
	.50	0.0027	0.0027	0.0026	0.0026	0.0026	0.0026
	.75	0.0053	0.0026	0.0053	0.0026	0.0051	0.0024

Note. *_total*= a variance calculated for a total ES, and *_total_nonr*= a variance calculated for a total ES without including it the correlation between the time measures. See Tables 12, 13 and 21 for definition of the other ES indexes.

Table 34. Mean of theoretical variance adjustment to the empirical variance as a function of the correlation.

r	$d_{hw_total_r}$	$d_{hw_total_nonr}$	$d_{b_total_r}$	$d_{b_total_nonr}$	$d_{g_total_r}$	$d_{g_total_nonr}$
.00	0.0087	0.0171	0.0082	0.0166	0.0084	0.0169
.25	0.0116	0.0171	0.0111	0.0166	0.0113	0.0168
.50	0.0176	0.0171	0.0170	0.0166	0.0171	0.0166
.75	0.0353	0.0170	0.0349	0.0166	0.0338	0.0155

Note. *_total*= a variance calculated for a total ES, and *_total_nonr*= a variance calculated for a total ES without including it the correlation between the time measures. See Tables 12, 13 and 21 for definition of the other ES indexes.