Supplemental Material S5: Table of minimum required values of level-3 units (K)

A. Minimum required values of level-3 units (K) under $\sigma_x^2 = 1$, two-sided significance level is $\alpha = 0.05$

and desired statistical power is $\psi = 0.80$

	ρ_2/Δ_3^*	0.10	0.20	0.30	0.40	0.50	0.60	0.70	0.80	0.90	1.00	3.00	5.00
$\eta_3^2 = 0.1$	0.01	--	785	197	88	50	32	22	17	13	10	8	1
	0.03	--	--	589	262	148	95	66	49	37	30	24	3
	0.05	--	--	982	437	246	157	110	81	62	49	40	5
	0.10	--	--	--	873	491	314	219	161	123	97	79	9
	0.20	--	--	--	--	982	628	437	321	246	194	157	18
	0.30	--	--	--	--	--	942	655	481	368	291	236	27
	0.50	--	--	--	--	--	--	--	801	614	485	393	44
$\eta_3^2 = 0.3$	0.01	349	88	22	10	6	4	3	2	2	2	1	1
	0.03	--	262	66	30	17	11	8	6	5	4	3	1
	0.05	--	437	110	49	28	18	13	9	7	6	5	1
	0.10	--	873	219	97	55	35	25	18	14	11	9	1
	0.20	--	--	437	194	110	70	49	36	28	22	18	2
	0.30	--	--	655	291	164	105	73	54	41	33	27	3
	0.50	--	--	--	485	273	175	122	89	69	54	44	5
$\eta_3^2 = 0.5$	0.01	126	32	8	4	2	2	1	1	1	1	1	1
	0.03	377	95	24	11	6	4	3	2	2	2	1	1
	0.05	628	157	40	18	10	7	5	4	3	2	2	1
	0.10	--	314	79	35	20	13	9	7	5	4	4	1
	0.20	--	628	157	70	40	26	18	13	10	8	7	1
	0.30	--	942	236	105	59	38	27	20	15	12	10	2
	0.50	--	--	393	175	99	63	44	33	25	20	16	2
$\eta_3^2 = 0.7$	0.01	65	17	5	2	2	1	1	1	1	1	1	1
	0.03	193	49	13	6	4	2	2	1	1	1	1	1
	0.05	321	81	21	9	6	4	3	2	2	1	1	1
	0.10	641	161	41	18	11	7	5	4	3	2	2	1
	0.20	--	321	81	36	21	13	9	7	6	4	4	1
	0.30	--	481	121	54	31	20	14	10	8	6	5	1
	0.50	--	801	201	89	51	33	23	17	13	10	9	1
$\eta_3^2 = 0.9$	0.01	39	10	3	2	1	1	1	1	1	1	1	1
	0.03	117	30	8	4	2	2	1	1	1	1	1	1
	0.05	194	49	13	6	4	2	2	1	1	1	1	1
	0.10	388	97	25	11	7	4	3	2	2	2	1	1
	0.20	776	194	49	22	13	8	6	4	4	3	2	1
	0.30	--	291	73	33	19	12	9	6	5	4	3	1
	0.50	--	485	122	54	31	20	14	10	8	6	5	1
$\eta_3^2 = 1.0$	0.01	32	8	2	1	1	1	1	1	1	1	1	1
	0.03	95	24	6	3	2	1	1	1	1	1	1	1
	0.05	157	40	10	5	3	2	2	1	1	1	1	1
	0.10	314	79	20	9	5	4	3	2	2	1	1	1
	0.20	628	157	40	18	10	7	5	4	3	2	2	1
	0.30	942	236	59	27	15	10	7	5	4	3	3	1
	0.50	--	393	99	44	25	16	11	9	7	5	4	1

$^*\rho_2$: correlation of residuals between level-2 (class) units; Δ_3^*: effect size from level-3 context; -- indicates value exceeds 1000.

* It should be noted that results showing the numbers less than around 20 can be more or less optimistic and unreliable since this result is derived based on the assumption of known residual variances.

B. Minimum required values of level-3 units (K) under $\sigma_x^2 = 1$, two-sided significance level is $\alpha = 0.05$ and

desired width of confidence interval L'

ρ_2 / L'^{*}	0.10	0.20	0.30	0.40	0.50	0.60	0.70	0.80	0.90	1.00	3.00	5.00
n3²= 0.1												
0.01	--	--	385	171	97	62	43	32	25	19	16	2
0.03	--	--	--	513	289	185	129	95	73	57	47	6
0.05	--	--	--	854	481	308	214	157	121	95	77	9
0.10	--	--	--	--	961	615	427	314	241	190	154	18
0.20	--	--	--	--	--	--	854	628	481	380	308	35
0.30	--	--	--	--	--	--	--	941	721	570	461	52
0.50	--	--	--	--	--	--	--	--	--	949	769	86
n3²= 0.3												
0.01	683	171	43	19	11	7	5	4	3	3	2	1
0.03	--	513	129	57	33	21	15	11	9	7	6	1
0.05	--	854	214	95	54	35	24	18	14	11	9	1
0.10	--	--	427	190	107	69	48	35	27	22	18	2
0.20	--	--	854	380	214	137	95	70	54	43	35	4
0.30	--	--	--	570	321	205	143	105	81	64	52	6
0.50	--	--	--	949	534	342	238	175	134	106	86	10
n3²= 0.5												
0.01	246	62	16	7	4	3	2	2	1	1	1	1
0.03	738	185	47	21	12	8	6	4	3	3	2	1
0.05	--	308	77	35	20	13	9	7	5	4	4	1
0.10	--	615	154	69	39	25	18	13	10	8	7	1
0.20	--	--	308	137	77	50	35	26	20	16	13	2
0.30	--	--	461	205	116	74	52	38	29	23	19	3
0.50	--	--	769	342	193	123	86	63	49	38	31	4
n3²= 0.7												
0.01	126	32	8	4	2	2	1	1	1	1	1	1
0.03	377	95	24	11	6	4	3	2	2	2	1	1
0.05	628	157	40	18	10	7	5	4	3	2	2	1
0.10	--	314	79	35	20	13	9	7	5	4	4	1
0.20	--	628	157	70	40	26	18	13	10	8	7	1
0.30	--	941	236	105	59	38	27	20	15	12	10	2
0.50	--	--	392	175	98	63	44	32	25	20	16	2
n3²= 0.9												
0.01	76	19	5	3	2	1	1	1	1	1	1	1
0.03	228	57	15	7	4	3	2	2	1	1	1	1
0.05	380	95	24	11	6	4	3	2	2	2	1	1
0.10	759	190	48	22	12	8	6	4	3	3	2	1
0.20	--	380	95	43	24	16	11	8	6	5	4	1
0.30	--	570	143	64	36	23	16	12	9	8	6	1
0.50	--	949	238	106	60	38	27	20	15	12	10	2
n3²=1.0												
0.01	62	16	4	2	1	1	1	1	1	1	1	1
0.03	185	47	12	6	3	2	2	1	1	1	1	1
0.05	308	77	20	9	5	4	3	2	2	1	1	1
0.10	615	154	39	18	10	7	5	4	3	2	2	1
0.20	--	308	77	35	20	13	9	7	5	4	4	1
0.30	--	461	116	52	29	19	13	10	8	6	5	1
0.50	--	769	193	86	49	31	22	16	13	10	8	1

$^{*}\rho_2$: correlation of residuals between level-2 (class) units; L': desired width of confidence interval; -- indicates value exceeds 1000.

* It should be noted that results showing the numbers less than around 20 can be more or less optimistic and unreliable since this result is derived based on the assumption of known residual variances.