

Simulation results to accompany:

Timmons, A. C., & Preacher, K. J. (in press). The importance of temporal design: How do measurement intervals affect the accuracy and efficiency of parameter estimates in longitudinal research? *Multivariate Behavioral Research*.

Note: PRB = percent relative bias; SE = standard error; ESD = empirical standard deviation. The number of measurement occasions is represented in the first column, and the spacing of measurement occasions is represented in the first row.

Linear Function

PRB of  $a_1$

	even	left	right	middle	extreme
6	7.0455	0.2599	-2.7501	0.8289	2.1895
11	-1.9178	-2.8880	-1.4394	-1.8616	0.9720
16	0.0022	-0.5633	2.0502	2.4353	2.4155
21	0.1473	0.3286	-2.1976	-1.8242	-2.6787

PRB of  $b_1$

	even	left	right	middle	extreme
6	-0.0495	-0.0141	-0.0146	0.0194	-0.0063
11	0.0545	0.0704	0.0108	0.0417	0.0098
16	0.0355	0.0264	-0.0421	-0.0654	-0.0120
21	-0.0143	-0.0180	0.0259	0.0037	0.0160

SE of  $a_1$

	even	left	right	middle	extreme
6	3.2645	2.9462	3.6783	3.2959	3.1221
11	2.8660	2.6614	3.3950	3.0511	2.6518
16	2.6628	2.4999	3.1230	2.8442	2.5202
21	2.5396	2.4412	2.8656	2.6942	2.4263

SE of  $b_1$

	even	left	right	middle	extreme
6	0.0689	0.0696	0.0696	0.0711	0.0613
11	0.0549	0.0619	0.0619	0.0650	0.0447
16	0.0470	0.0540	0.0539	0.0584	0.0373
21	0.0416	0.0474	0.0474	0.0514	0.0340

ESD for  $a_1$ 

	even	left	right	middle	extreme
6	3.2153	3.0029	3.6916	3.3935	3.0747
11	2.8331	2.6103	3.4414	2.9420	2.6171
16	2.7151	2.6154	3.1525	2.8461	2.5761
21	2.5651	2.4272	2.8392	2.6659	2.4076

ESD for  $b_1$ 

	even	left	right	middle	extreme
6	0.0692	0.0706	0.0718	0.0738	0.0614
11	0.0551	0.0634	0.0621	0.0643	0.0447
16	0.0459	0.0550	0.0541	0.0571	0.0379
21	0.0411	0.0484	0.0451	0.0514	0.0336

Quadratic Function

PRB for  $a_2$ 

	even	left	right	middle	extreme
6	0.0769	0.0494	-0.0083	0.1406	0.0409
11	-0.0439	-0.0224	-0.0203	-0.0520	0.0335
16	-0.0166	-0.0553	0.0170	0.1101	-0.0103
21	-0.0182	0.0061	-0.0536	-0.0243	-0.0327

PRB for  $b_2$ 

	even	left	right	middle	extreme
6	0.0463	0.0399	0.0204	0.1167	0.0346
11	-0.0568	-0.0273	0.0092	-0.0241	-0.0222
16	-0.0253	-0.0465	0.0064	0.0759	-0.0339
21	0.0256	0.0200	-0.0304	0.0069	-0.0283

PRB for  $c_2$ 

	even	left	right	middle	extreme
6	0.0337	0.0230	0.0289	0.1087	0.0303
11	-0.0449	-0.0079	0.0059	-0.0273	-0.0276
16	-0.0221	-0.0285	-0.0001	0.0585	-0.0351
21	0.0304	0.0151	-0.0172	0.0052	-0.0172

SE for  $a_2$ 

	even	left	right	middle	extreme
6	6.3515	5.7666	6.7159	6.4208	6.0699
11	5.7449	5.2317	6.6711	6.2319	5.1097
16	5.3699	4.9043	6.5075	5.9402	4.8774
21	5.1100	4.7606	6.2024	5.6298	4.7210

SE for  $b_2$ 

	even	left	right	middle	extreme
6	0.3875	0.3841	0.3833	0.3771	0.4596
11	0.3227	0.2978	0.3321	0.3252	0.3656
16	0.2817	0.2629	0.3158	0.2990	0.3062
21	0.2525	0.2361	0.2958	0.2771	0.2609

SE for  $C_2$ 

	even	left	right	middle	extreme
6	0.0062	0.0061	0.0061	0.0060	0.0075
11	0.0052	0.0050	0.0050	0.0051	0.0061
16	0.0045	0.0046	0.0046	0.0047	0.0050
21	0.0041	0.0042	0.0042	0.0044	0.0042

ESD for  $a_2$ 

	even	left	right	middle	extreme
6	6.2394	5.6508	6.3765	6.6309	5.9049
11	5.6221	5.3148	7.0401	6.0461	5.0448
16	5.5559	4.9686	6.5682	5.9119	4.9402
21	5.1573	4.6917	6.4141	5.4402	4.6516

ESD for  $b_2$ 

	even	left	right	middle	extreme
6	0.4073	0.3856	0.3750	0.3904	0.4408
11	0.3348	0.2964	0.3489	0.3192	0.3619
16	0.2801	0.2583	0.3102	0.2962	0.2933
21	0.2607	0.2270	0.3103	0.2672	0.2557

ESD for  $C_2$ 

	even	left	right	middle	extreme
6	0.0065	0.0062	0.0060	0.0063	0.0071
11	0.0055	0.0050	0.0053	0.0050	0.0060
16	0.0045	0.0045	0.0045	0.0046	0.0049
21	0.0042	0.0041	0.0045	0.0042	0.0042

Cubic Function

PRB for  $a_3$ 

	even	left	right	middle	extreme
6	-0.1266	-0.0280	0.0027	-0.1184	-0.1049
11	0.0378	-0.0008	-0.0452	0.0117	-0.0380
16	-0.0347	-0.0964	-0.1065	0.0004	-0.1524
21	-0.0352	0.0965	0.0126	0.0989	0.0906

PRB for  $b_3$ 

	even	left	right	middle	extreme
6	-0.0507	0.0247	-0.0287	-0.0388	-0.0093
11	0.0288	-0.0318	-0.0195	0.0040	0.0116
16	0.0080	-0.0063	0.0111	-0.0138	0.0094
21	0.0061	-0.0035	0.0000	0.0495	0.0137

PRB for  $C_3$ 

	even	left	right	middle	extreme
6	-0.0563	0.0347	-0.0385	-0.0231	-0.0068
11	0.0052	-0.0529	-0.0180	0.0087	-0.0034
16	0.0064	-0.0131	0.0225	-0.0016	0.0084
21	0.0022	-0.0151	-0.0092	0.0419	0.0105

PRB for  $d_3$ 

	even	left	right	middle	extreme
6	-0.0594	0.0353	-0.0423	-0.0116	-0.0042
11	-0.0068	-0.0614	-0.0150	0.0135	-0.0137
16	0.0055	-0.0187	0.0245	0.0045	0.0032
21	-0.0029	-0.0258	-0.0132	0.0364	0.0080

SE for  $a_3$ 

	even	left	right	middle	extreme
6	14.3496	14.0544	14.4384	14.3649	14.2304
11	14.0557	13.7270	14.4343	14.3647	13.4445
16	13.7704	13.4480	14.3512	14.1431	13.2532
21	13.5557	13.1628	14.2888	13.9640	13.0593

SE for  $b_3$ 

	even	left	right	middle	extreme
6	1.1199	1.3113	1.5297	1.1436	1.1666
11	0.9503	1.0121	1.0867	0.9379	0.9245
16	0.8495	0.8269	0.8988	0.8696	0.8257
21	0.7720	0.6879	0.8123	0.8305	0.7062

SE for  $c_3$ 

	even	left	right	middle	extreme
6	0.0464	0.0617	0.0656	0.0480	0.0462
11	0.0379	0.0442	0.0453	0.0375	0.0375
16	0.0336	0.0346	0.0354	0.0340	0.0328
21	0.0303	0.0284	0.0300	0.0318	0.0283

SE for  $d_3$ 

	even	left	right	middle	extreme
6	0.0005	0.0007	0.0007	0.0005	0.0005
11	0.0004	0.0005	0.0005	0.0004	0.0004
16	0.0004	0.0004	0.0004	0.0004	0.0004
21	0.0003	0.0003	0.0003	0.0003	0.0003

ESD for  $a_3$ 

	even	left	right	middle	extreme
6	13.7705	13.8617	14.3443	14.3464	13.9940
11	13.5819	13.4033	14.3273	13.7417	13.0411
16	13.7154	14.1489	14.0997	15.1478	13.5902
21	13.5417	13.5430	14.3436	14.0064	13.1560

ESD for  $b_3$ 

	even	left	right	middle	extreme
6	1.1247	1.3352	1.5688	1.2025	1.1952
11	0.9648	0.9962	1.0920	0.9050	0.9261
16	0.8670	0.8177	0.9127	0.9068	0.8066
21	0.7835	0.6320	0.7864	0.9030	0.7140

ESD for  $c_3$ 

	even	left	right	middle	extreme
6	0.0460	0.0621	0.0668	0.0508	0.0473
11	0.0380	0.0438	0.0450	0.0366	0.0371
16	0.0343	0.0344	0.0360	0.0351	0.0325
21	0.0310	0.0262	0.0290	0.0346	0.0280

ESD for  $d_3$ 

	even	left	right	middle	extreme
6	0.0005	0.0007	0.0007	0.0006	0.0005
11	0.0004	0.0005	0.0005	0.0004	0.0004
16	0.0004	0.0004	0.0004	0.0004	0.0004
21	0.0003	0.0003	0.0003	0.0004	0.0003

Power Function

PRB for  $a_4$ 

	even	left	right	middle	extreme
6	-11.4755	-9.0626	-20.8802	-11.8746	-13.5882
11	-6.1746	-5.0318	-10.0775	-6.7105	-7.4044
16	-4.1950	-3.6223	-6.4057	-4.6310	-4.9531
21	-3.2066	-3.1862	-4.2129	-3.6663	-3.5830

PRB for  $b_4$ 

	even	left	right	middle	extreme
6	3.7869	2.9796	7.0714	3.9451	4.4330
11	1.9953	1.6898	3.2428	2.2197	2.3302
16	1.3612	1.2353	2.0282	1.5368	1.5457
21	1.0101	1.0494	1.3133	1.1893	1.0950

SE for  $a_4$ 

	even	left	right	middle	extreme
6	0.5110	0.4866	0.5579	0.5082	0.5255
11	0.4437	0.4255	0.4894	0.4482	0.4641
16	0.4106	0.4001	0.4447	0.4167	0.4267
21	0.3910	0.3879	0.4069	0.3979	0.3947

SE for  $b_4$ 

	even	left	right	middle	extreme
6	0.0126	0.0114	0.0161	0.0127	0.0133
11	0.0093	0.0088	0.0115	0.0098	0.0100
16	0.0078	0.0076	0.0093	0.0084	0.0082
21	0.0068	0.0070	0.0075	0.0074	0.0068

ESD for  $a_4$ 

	even	left	right	middle	extreme
6	0.5856	0.5480	0.6837	0.5950	0.6227
11	0.4774	0.4405	0.5490	0.4701	0.5057
16	0.4480	0.4422	0.4854	0.4454	0.4708
21	0.4093	0.3995	0.4373	0.4079	0.4117

ESD for  $b_4$ 

	even	left	right	middle	extreme
6	0.0142	0.0124	0.0193	0.0146	0.0155
11	0.0101	0.0091	0.0128	0.0101	0.0109
16	0.0080	0.0079	0.0097	0.0085	0.0089
21	0.0071	0.0071	0.0078	0.0074	0.0072

Exponential Function

PRB for  $a_5$ 

	even	left	right	middle	extreme
6	-11.2985	-15.1059	-10.3561	-11.9805	-13.3074
11	-6.1495	-12.1613	-5.2651	-5.6360	-8.6875
16	-4.2696	-6.8606	-3.8501	-4.0593	-5.9303
21	-3.5678	-4.2702	-2.8810	-3.1354	-4.6733

PRB for  $b_5$ 

	even	left	right	middle	extreme
6	2.6452	3.8655	2.4332	2.8036	3.1656
11	1.4345	2.8002	1.2272	1.3025	2.0319
16	1.0112	1.5716	0.9060	0.9525	1.3753
21	0.8221	0.9660	0.6572	0.7283	1.0579

SE for  $a_5$ 

	even	left	right	middle	extreme
6	0.2769	0.8000	0.2693	0.2763	0.2802
11	0.2505	0.2792	0.2432	0.2459	0.2636
16	0.2381	0.2548	0.2313	0.2329	0.2477
21	0.2301	0.2358	0.2237	0.2260	0.2374

SE for  $b_5$ 

	even	left	right	middle	extreme
6	0.0008	0.0029	0.0008	0.0008	0.0009
11	0.0006	0.0008	0.0006	0.0006	0.0007
16	0.0005	0.0006	0.0005	0.0005	0.0006
21	0.0005	0.0005	0.0004	0.0005	0.0005

ESD for  $a_5$ 

	even	left	right	middle	extreme
6	0.3223	0.7360	0.3032	0.3203	0.3219
11	0.2723	0.3252	0.2526	0.2545	0.2830
16	0.2624	0.3014	0.2510	0.2485	0.2723
21	0.2460	0.2491	0.2374	0.2367	0.2444

ESD for  $b_5$ 

	even	left	right	middle	extreme
6	0.0009	0.0031	0.0009	0.0009	0.0010
11	0.0007	0.0010	0.0006	0.0006	0.0008
16	0.0006	0.0007	0.0005	0.0005	0.0007
21	0.0005	0.0005	0.0004	0.0005	0.0005



Gompertz Function

PRB for  $a_6$ 

	even	left	right	middle	extreme
6	-0.1894	11.4298	-0.1478	-0.0913	-0.4966
11	-0.0797	-0.0459	-0.0657	-0.0684	-0.2421
16	-0.0646	-0.0780	-0.0565	-0.0859	-0.1014
21	-0.0745	-0.1603	-0.0454	-0.1170	-0.1038

PRB for  $b_6$ 

	even	left	right	middle	extreme
6	1.1442	-31.6893	0.9427	0.6286	7.9416
11	0.3413	0.3832	0.2760	0.2642	2.6782
16	0.3346	0.1905	0.2260	0.2216	0.9795
21	0.1738	0.3350	0.1132	0.2643	0.6898

PRB for  $c_6$ 

	even	left	right	middle	extreme
6	1.1998	-35.6532	0.9248	0.6645	6.9069
11	0.3753	0.4329	0.2949	0.2906	2.4151
16	0.3629	0.2334	0.2409	0.2463	0.9238
21	0.2006	0.3772	0.1289	0.2986	0.6642

SE for  $a_6$ 

	even	left	right	middle	extreme
6	6.5973	38.2291	5.7625	6.2411	8.9986
11	5.5856	5.9995	5.2648	5.8187	6.9858
16	5.3017	5.8794	5.0292	5.6025	5.7284
21	5.1253	5.8308	4.8998	5.4256	5.3019

SE for  $b_6$ 

	even	left	right	middle	extreme
6	0.2009	0.4953	0.1788	0.1358	0.8569
11	0.1031	0.1507	0.0922	0.0879	0.4439
16	0.0867	0.1010	0.0797	0.0707	0.2579
21	0.0758	0.0809	0.0684	0.0640	0.1729

SE for  $C_6$ 

	even	left	right	middle	extreme
6	0.0057	0.0161	0.0048	0.0040	0.0207
11	0.0029	0.0044	0.0026	0.0026	0.0109
16	0.0025	0.0029	0.0022	0.0021	0.0065
21	0.0022	0.0023	0.0019	0.0019	0.0045

ESD for  $a_6$ 

	even	left	right	middle	extreme
6	6.4862	10.5088	5.5153	6.3320	8.3990
11	5.4653	5.8340	5.1268	5.7265	6.7920
16	5.5103	5.9015	5.2558	5.8247	5.9794
21	5.1574	5.7877	4.9194	5.3290	5.2469

ESD for  $b_6$ 

	even	left	right	middle	extreme
6	0.1954	0.1476	0.1823	0.1370	0.8060
11	0.1025	0.1447	0.0915	0.0895	0.4291
16	0.0889	0.1025	0.0819	0.0703	0.2565
21	0.0760	0.0794	0.0667	0.0654	0.1660

ESD for  $C_6$ 

	even	left	right	middle	extreme
6	0.0055	0.0048	0.0048	0.0040	0.0194
11	0.0029	0.0042	0.0026	0.0026	0.0105
16	0.0025	0.0029	0.0023	0.0021	0.0065
21	0.0022	0.0023	0.0019	0.0020	0.0043