

Results of the Simulation Study of Categorical Data

with 5 categories and $y_1 = 0$ Table 9: The results summarized from 1000 replications of the categorical data with $nc = 5$ categories, $N = 50$ individuals, $T = 5$ observations for each individual, and a fixed $y_1 = 0$

		True	Est.	Bias.abs	Bias.rel	SE.emp	SE.avg	MSE	Cover	Code	
P.L.	Exact	μ	1.5	2.0002	0.5002	0.3335	0.1847	0.1839	0.2844	0.2180	2
		α	0.5	0.3333	0.1667	0.3334	0.0602	0.0600	0.0314	0.2070	
		ψ	0.4811	0.4136	0.0675	0.1404	0.0404	0.0372	0.0062	0.5250	
	Cond.	μ	1.5	1.7317	0.2317	0.1544	0.2360	0.2363	0.1094	0.8430	2
		α	0.5	0.4228	0.0772	0.1544	0.0766	0.0769	0.0118	0.8370	
		ψ	0.4811	0.5123	0.0312	0.0648	0.0503	0.0512	0.0035	0.9390	
P.D.	Exact	μ	1.5	2.0737	0.5737	0.3824	0.1746	0.1848	0.3596	0.1060	2
		α	0.5	0.3090	0.1910	0.3820	0.0566	0.0600	0.0397	0.0920	
		ψ	0.4811	0.4280	0.0531	0.1105	0.0419	0.0383	0.0046	0.6500	
	Cond.	μ	1.5	2.0700	0.5700	0.3800	0.1753	0.1857	0.3556	0.1140	2
		α	0.5	0.3102	0.1898	0.3795	0.0568	0.0603	0.0392	0.1030	
		ψ	0.4811	0.4297	0.0514	0.1069	0.0421	0.0385	0.0044	0.6690	

Note: With the same notations as in Table 1.

Table 10: The results summarized from 1000 replications of the categorical data with $nc = 5$ categories, $N = 200$ individuals, $T = 50$ observations for each individual, and a fixed $y_1 = 0$

		True	Est.	Bias.abs	Bias.rel	SE.emp	SE.avg	MSE	Cover	Code	
P.L.	Exact	μ	1.5	1.7245	0.2245	0.1496	0.0289	0.0279	0.0512	0.0000	2
		α	0.5	0.4251	0.0749	0.1497	0.0094	0.0090	0.0057	0.0000	
		ψ	0.4811	0.5098	0.0287	0.0597	0.0068	0.0072	0.0009	0.0120	
	Cond.	μ	1.5	1.6985	0.1985	0.1324	0.0295	0.0286	0.0403	0.0000	3
		α	0.5	0.4338	0.0662	0.1324	0.0096	0.0092	0.0045	0.0000	
		ψ	0.4811	0.5202	0.0391	0.0812	0.0069	0.0074	0.0016	0.0000	
P.D.	Exact	μ	1.5	1.7253	0.2253	0.1502	0.0291	0.0281	0.0516	0.0000	1
		α	0.5	0.4249	0.0751	0.1503	0.0095	0.0091	0.0057	0.0000	
		ψ	0.4811	0.5121	0.0310	0.0645	0.0068	0.0072	0.0010	0.0070	
	Cond.	μ	1.5	1.7252	0.2252	0.1501	0.0291	0.0281	0.0515	0.0000	3
		α	0.5	0.4249	0.0751	0.1502	0.0095	0.0091	0.0057	0.0000	
		ψ	0.4811	0.5122	0.0311	0.0646	0.0068	0.0072	0.0010	0.0070	

Note: With the same notations as in Table 1.

Results with $y_1 \sim N(0, \psi)$ Table 11: The results summarized from 1000 replications of the categorical data with $nc = 5$ categories, $N = 50$ individuals, $T = 5$ observations for each individual, and a fixed $y_1 \sim N(0, \psi)$

		True	Est.	Bias.abs	Bias.rel	SE.emp	SE.avg	MSE	Cover	Code	
P.L.	Exact	μ	1.5	1.7948	0.2948	0.1966	0.1938	0.1883	0.1245	0.6750	2
		α	0.5	0.4027	0.0973	0.1945	0.0624	0.0612	0.0134	0.6660	
		ψ	0.4811	0.4969	0.0157	0.0327	0.0435	0.0449	0.0021	0.9580	
	Cond.	μ	1.5	1.7468	0.2468	0.1645	0.2089	0.2048	0.1045	0.7900	2
		α	0.5	0.4192	0.0808	0.1615	0.0669	0.0661	0.0110	0.7770	
		ψ	0.4811	0.5153	0.0342	0.0711	0.0495	0.0516	0.0036	0.9430	
P.D.	Exact	μ	1.5	2.0071	0.5071	0.3381	0.1864	0.1849	0.2920	0.2050	2
		α	0.5	0.3321	0.1679	0.3358	0.0593	0.0596	0.0317	0.1830	
		ψ	0.4811	0.5306	0.0495	0.1029	0.0476	0.0475	0.0047	0.8620	
	Cond.	μ	1.5	2.0068	0.5068	0.3379	0.1867	0.1851	0.2917	0.2070	2
		α	0.5	0.3322	0.1678	0.3355	0.0593	0.0597	0.0317	0.1880	
		ψ	0.4811	0.5309	0.0498	0.1034	0.0477	0.0476	0.0048	0.8630	

Note: With the same notations as in Table 1.

Table 12: The results summarized from 1000 replications of the categorical data with $nc = 5$ categories, $N = 200$ individuals, $T = 50$ observations for each individual, and a fixed $y_1 \sim N(0, \psi)$

		True	Est.	Bias.abs	Bias.rel	SE.emp	SE.avg	MSE	Cover	Code	
P.L.	Exact	μ	1.5	1.7039	0.2039	0.1359	0.0287	0.0280	0.0424	0.0000	2
		α	0.5	0.4321	0.0679	0.1358	0.0093	0.0090	0.0047	0.0000	
		ψ	0.4811	0.5181	0.0370	0.0769	0.0071	0.0073	0.0014	0.0000	
	Cond.	μ	1.5	1.6985	0.1985	0.1323	0.0290	0.0283	0.0402	0.0000	3
		α	0.5	0.4339	0.0661	0.1322	0.0093	0.0091	0.0045	0.0000	
		ψ	0.4811	0.5203	0.0392	0.0814	0.0073	0.0074	0.0016	0.0000	
P.D.	Exact	μ	1.5	1.7247	0.2247	0.1498	0.0289	0.0281	0.0513	0.0000	1
		α	0.5	0.4252	0.0748	0.1496	0.0093	0.0091	0.0057	0.0000	
		ψ	0.4811	0.5224	0.0413	0.0858	0.0072	0.0074	0.0018	0.0000	
	Cond.	μ	1.5	1.7247	0.2247	0.1498	0.0289	0.0281	0.0513	0.0000	2
		α	0.5	0.4252	0.0748	0.1496	0.0093	0.0091	0.0057	0.0000	
		ψ	0.4811	0.5224	0.0413	0.0858	0.0072	0.0074	0.0018	0.0000	

Note: With the same notations as in Table 1.

Results with $y_1 \sim N(\frac{\mu}{1-\alpha}, \frac{\psi}{1-\alpha^2})$

Table 13: The results summarized from 1000 replications of the categorical data with $nc = 5$ categories, $N = 50$ individuals, $T = 5$ observations for each individual, and a fixed $y_1 \sim N(\frac{\mu}{1-\alpha}, \frac{\psi}{1-\alpha^2})$

		True	Est.	Bias.abs	Bias.rel	SE.emp	SE.avg	MSE	Cover	Code	
P.L.	Exact	μ	1.5	1.7243	0.2243	0.1496	0.1972	0.1877	0.0892	0.7930	2
		α	0.5	0.4252	0.0748	0.1497	0.0643	0.0611	0.0097	0.7900	
		ψ	0.4811	0.5152	0.0341	0.0708	0.0460	0.0466	0.0033	0.9200	
	Cond.	μ	1.5	1.7232	0.2232	0.1488	0.2068	0.1981	0.0926	0.8050	2
		α	0.5	0.4256	0.0744	0.1489	0.0665	0.0638	0.0100	0.7990	
		ψ	0.4811	0.5140	0.0329	0.0684	0.0507	0.0514	0.0036	0.9360	
P.D.	Exact	μ	1.5	1.9759	0.4759	0.3173	0.1868	0.1843	0.2614	0.2600	2
		α	0.5	0.3413	0.1587	0.3173	0.0604	0.0594	0.0288	0.2420	
		ψ	0.4811	0.5567	0.0756	0.1572	0.0504	0.0498	0.0083	0.7090	
	Cond.	μ	1.5	1.9760	0.4760	0.3173	0.1872	0.1844	0.2616	0.2610	2
		α	0.5	0.3413	0.1587	0.3174	0.0605	0.0594	0.0288	0.2450	
		ψ	0.4811	0.5567	0.0755	0.1570	0.0505	0.0499	0.0083	0.7050	

Note: With the same notations as in Table 1.

Table 14: The results summarized from 1000 replications of the categorical data with $nc = 5$ categories, $N = 200$ individuals, $T = 50$ observations for each individual, and a fixed $y_1 \sim N(\frac{\mu}{1-\alpha}, \frac{\psi}{1-\alpha^2})$

		True	Est.	Bias.abs	Bias.rel	SE.emp	SE.avg	MSE	Cover	Code	
P.L.	Exact	μ	1.5	1.6962	0.1962	0.1308	0.0285	0.0281	0.0393	0.0000	2
		α	0.5	0.4345	0.0655	0.1309	0.0093	0.0091	0.0044	0.0000	
		ψ	0.4811	0.5198	0.0387	0.0804	0.0070	0.0074	0.0015	0.0000	
	Cond.	μ	1.5	1.6961	0.1961	0.1308	0.0287	0.0282	0.0393	0.0000	2
		α	0.5	0.4346	0.0654	0.1309	0.0093	0.0091	0.0044	0.0000	
		ψ	0.4811	0.5198	0.0387	0.0804	0.0071	0.0074	0.0015	0.0000	
P.D.	Exact	μ	1.5	1.7221	0.2221	0.1481	0.0283	0.0281	0.0501	0.0000	1
		α	0.5	0.4259	0.0741	0.1482	0.0092	0.0090	0.0056	0.0000	
		ψ	0.4811	0.5246	0.0435	0.0903	0.0072	0.0074	0.0019	0.0000	
	Cond.	μ	1.5	1.7221	0.2221	0.1481	0.0283	0.0281	0.0501	0.0000	2
		α	0.5	0.4259	0.0741	0.1482	0.0092	0.0090	0.0056	0.0000	
		ψ	0.4811	0.5246	0.0435	0.0903	0.0072	0.0074	0.0019	0.0000	

Note: With the same notations as in Table 1.

Results of the simulation study with 7 categories and $y_1 = 0$ Table 15: The results summarized from 1000 replications of the categorical data with $nc = 7$ categories, $N = 50$ individuals, $T = 5$ observations for each individual, and a fixed $y_1 = 0$

		True	Est.	Bias.abs	Bias.rel	SE.emp	SE.avg	MSE	Cover	Code	
P.L.	Exact	μ	2	2.5456	0.5456	0.2728	0.2605	0.2427	0.3655	0.3930	
		α	0.5	0.3637	0.1363	0.2725	0.0624	0.0590	0.0225	0.3750	2
		ψ	1.2053	0.9995	0.2058	0.1708	0.0957	0.0900	0.0515	0.3990	
	Cond.	μ	2	2.1549	0.1549	0.0775	0.3327	0.3135	0.1347	0.9160	
		α	0.5	0.4615	0.0385	0.0771	0.0792	0.0759	0.0078	0.9150	2
		ψ	1.2053	1.2360	0.0307	0.0255	0.1190	0.1236	0.0151	0.9660	
P.D.	Exact	μ	2	2.6562	0.6562	0.3281	0.2461	0.2463	0.4912	0.2390	
		α	0.5	0.3360	0.1640	0.3280	0.0583	0.0594	0.0303	0.2070	2
		ψ	1.2053	1.0425	0.1628	0.1350	0.1007	0.0933	0.0366	0.5590	
	Cond.	μ	2	2.6508	0.6508	0.3254	0.2472	0.2475	0.4846	0.2550	
		α	0.5	0.3373	0.1627	0.3254	0.0586	0.0597	0.0299	0.2190	2
		ψ	1.2053	1.0467	0.1586	0.1316	0.1011	0.0938	0.0354	0.5690	

Note: With the same notations as in Table 1.

Table 16: The results summarized from 1000 replications of the categorical data with $nc = 7$ categories, $N = 200$ individuals, $T = 50$ observations for each individual, and a fixed $y_1 = 0$

		True	Est.	Bias.abs	Bias.rel	SE.emp	SE.avg	MSE	Cover	Code	
P.L.	Exact	μ	2	2.1454	0.1454	0.0727	0.0379	0.0368	0.0226	0.0250	
		α	0.5	0.4636	0.0364	0.0727	0.0091	0.0088	0.0014	0.0220	2
		ψ	1.2053	1.2230	0.0177	0.0147	0.0169	0.0173	0.0006	0.8370	
	Cond.	μ	2	2.1077	0.1077	0.0539	0.0387	0.0378	0.0131	0.1840	
		α	0.5	0.4731	0.0269	0.0539	0.0093	0.0090	0.0008	0.1440	2
		ψ	1.2053	1.2478	0.0425	0.0353	0.0173	0.0178	0.0021	0.3150	
P.D.	Exact	μ	2	2.1465	0.1465	0.0733	0.0379	0.0371	0.0229	0.0250	
		α	0.5	0.4634	0.0366	0.0733	0.0091	0.0089	0.0014	0.0200	2
		ψ	1.2053	1.2299	0.0246	0.0204	0.0170	0.0174	0.0009	0.7220	
	Cond.	μ	2	2.1464	0.1464	0.0732	0.0379	0.0371	0.0229	0.0250	
		α	0.5	0.4634	0.0366	0.0732	0.0091	0.0089	0.0014	0.0210	2
		ψ	1.2053	1.2300	0.0247	0.0205	0.0170	0.0174	0.0009	0.7200	

Note: With the same notations as in Table 1.

Results with $y_1 \sim N(0, \psi)$ Table 17: The results summarized from 1000 replications of the categorical data with $nc = 7$ categories, $N = 50$ individuals, $T = 5$ observations for each individual, and a fixed $y_1 \sim N(0, \psi)$

		True	Est.	Bias.abs	Bias.rel	SE.emp	SE.avg	MSE	Cover	Code	
P.L.	Exact	μ	2	2.2378	0.2378	0.1189	0.2458	0.2459	0.1170	0.8650	
		α	0.5	0.4404	0.0596	0.1192	0.0586	0.0596	0.0070	0.8610	2
		ψ	1.2053	1.1885	0.0168	0.0140	0.1005	0.1075	0.0104	0.9570	
	Cond.	μ	2	2.1587	0.1587	0.0794	0.2744	0.2715	0.1005	0.9170	
		α	0.5	0.4594	0.0406	0.0813	0.0639	0.0650	0.0057	0.9150	2
		ψ	1.2053	1.2349	0.0296	0.0245	0.1183	0.1235	0.0149	0.9650	
P.D.	Exact	μ	2	2.5499	0.5499	0.2749	0.2449	0.2462	0.3624	0.4100	
		α	0.5	0.3623	0.1377	0.2755	0.0577	0.0589	0.0223	0.3550	2
		ψ	1.2053	1.2892	0.0839	0.0696	0.1151	0.1153	0.0203	0.9200	
	Cond.	μ	2	2.5487	0.5487	0.2744	0.2452	0.2466	0.3612	0.4100	
		α	0.5	0.3625	0.1375	0.2750	0.0577	0.0590	0.0222	0.3610	2
		ψ	1.2053	1.2901	0.0848	0.0703	0.1154	0.1156	0.0205	0.9200	

Note: With the same notations as in Table 1.

Table 18: The results summarized from 1000 replications of the categorical data with $nc = 7$ categories, $N = 200$ individuals, $T = 50$ observations for each individual, and a fixed $y_1 \sim N(0, \psi)$

		True	Est.	Bias.abs	Bias.rel	SE.emp	SE.avg	MSE	Cover	Code	
P.L.	Exact	μ	2	2.1161	0.1161	0.0580	0.0370	0.0370	0.0148	0.1150	
		α	0.5	0.4709	0.0291	0.0582	0.0088	0.0088	0.0009	0.0850	2
		ψ	1.2053	1.2408	0.0355	0.0295	0.0175	0.0176	0.0016	0.4610	
	Cond.	μ	2	2.1077	0.1077	0.0539	0.0374	0.0374	0.0130	0.1770	
		α	0.5	0.4730	0.0270	0.0541	0.0089	0.0089	0.0008	0.1480	2
		ψ	1.2053	1.2463	0.0410	0.0340	0.0177	0.0178	0.0020	0.3690	
P.D.	Exact	μ	2	2.1461	0.1461	0.0730	0.0369	0.0372	0.0227	0.0170	
		α	0.5	0.4634	0.0366	0.0732	0.0088	0.0089	0.0014	0.0070	2
		ψ	1.2053	1.2535	0.0482	0.0400	0.0177	0.0177	0.0026	0.2240	
	Cond.	μ	2	2.1460	0.1460	0.0730	0.0369	0.0372	0.0227	0.0160	
		α	0.5	0.4634	0.0366	0.0732	0.0088	0.0089	0.0014	0.0070	2
		ψ	1.2053	1.2535	0.0482	0.0400	0.0177	0.0177	0.0026	0.2240	

Note: With the same notations as in Table 1.

Results with $y_1 \sim N(\frac{\mu}{1-\alpha}, \frac{\psi}{1-\alpha^2})$

Table 19: The results summarized from 1000 replications of the categorical data with $nc = 7$ categories, $N = 50$ individuals, $T = 5$ observations for each individual, and a fixed $y_1 \sim N(\frac{\mu}{1-\alpha}, \frac{\psi}{1-\alpha^2})$

		True	Est.	Bias.abs	Bias.rel	SE.emp	SE.avg	MSE	Cover	Code	
P.L.	Exact	μ	2	2.1288	0.1288	0.0644	0.2544	0.2439	0.0813	0.9220	
		α	0.5	0.4673	0.0327	0.0654	0.0616	0.0591	0.0049	0.9310	2
		ψ	1.2053	1.2343	0.0290	0.0241	0.1095	0.1118	0.0128	0.9630	
	Cond.	μ	2	2.1308	0.1308	0.0654	0.2714	0.2608	0.0908	0.9160	
		α	0.5	0.4669	0.0331	0.0662	0.0645	0.0623	0.0053	0.9200	2
		ψ	1.2053	1.2293	0.0240	0.0199	0.1214	0.1230	0.0153	0.9600	
P.D.	Exact	μ	2	2.5118	0.5118	0.2559	0.2527	0.2456	0.3258	0.4720	
		α	0.5	0.3714	0.1286	0.2573	0.0603	0.0587	0.0202	0.4360	2
		ψ	1.2053	1.3635	0.1582	0.1312	0.1223	0.1220	0.0400	0.7790	
	Cond.	μ	2	2.5116	0.5116	0.2558	0.2527	0.2459	0.3255	0.4780	
		α	0.5	0.3714	0.1286	0.2572	0.0602	0.0587	0.0202	0.4370	2
		ψ	1.2053	1.3636	0.1583	0.1313	0.1225	0.1222	0.0401	0.7830	

Note: With the same notations as in Table 1.

Table 20: The results summarized from 1000 replications of the categorical data with $nc = 7$ categories, $N = 200$ individuals, $T = 50$ observations for each individual, and a fixed $y_1 \sim N(\frac{\mu}{1-\alpha}, \frac{\psi}{1-\alpha^2})$

		True	Est.	Bias.abs	Bias.rel	SE.emp	SE.avg	MSE	Cover	Code	
P.L.	Exact	μ	2	2.1083	0.1083	0.0541	0.0373	0.0371	0.0131	0.1530	
		α	0.5	0.4729	0.0271	0.0542	0.0090	0.0088	0.0008	0.1330	2
		ψ	1.2053	1.2471	0.0418	0.0347	0.0165	0.0176	0.0020	0.3280	
	Cond.	μ	2	2.1083	0.1083	0.0542	0.0376	0.0373	0.0131	0.1630	
		α	0.5	0.4729	0.0271	0.0542	0.0090	0.0089	0.0008	0.1400	2
		ψ	1.2053	1.2472	0.0419	0.0347	0.0166	0.0178	0.0020	0.3310	
P.D.	Exact	μ	2	2.1462	0.1462	0.0731	0.0375	0.0372	0.0228	0.0230	
		α	0.5	0.4634	0.0366	0.0732	0.0090	0.0089	0.0014	0.0160	2
		ψ	1.2053	1.2614	0.0561	0.0466	0.0169	0.0178	0.0034	0.0940	
	Cond.	μ	2	2.1462	0.1462	0.0731	0.0375	0.0372	0.0228	0.0230	
		α	0.5	0.4634	0.0366	0.0732	0.0090	0.0089	0.0014	0.0170	2
		ψ	1.2053	1.2614	0.0561	0.0466	0.0169	0.0178	0.0034	0.0940	

Note: With the same notations as in Table 1.

Results of the simulation study with 9 categories and $y_1 = 0$ Table 21: The results summarized from 1000 replications of the categorical data with $nc = 9$ categories, $N = 50$ individuals, $T = 5$ observations for each individual, and a fixed $y_1 = 0$

		True	Est.	Bias.abs	Bias.rel	SE.emp	SE.avg	MSE	Cover	Code	
P.L.	Exact	μ	2.5	3.1544	0.6544	0.2618	0.3066	0.3038	0.5222	0.4300	2
		α	0.5	0.3684	0.1316	0.2633	0.0597	0.0588	0.0209	0.3940	
		ψ	2.2750	1.8701	0.4049	0.1780	0.1839	0.1684	0.1978	0.3500	
	Cond.	μ	2.5	2.6606	0.1606	0.0642	0.3922	0.3928	0.1796	0.9370	2
		α	0.5	0.4668	0.0332	0.0664	0.0758	0.0756	0.0068	0.9290	
		ψ	2.2750	2.3115	0.0365	0.0160	0.2280	0.2312	0.0533	0.9540	
P.D.	Exact	μ	2.5	3.2921	0.7921	0.3168	0.2903	0.3093	0.7117	0.2620	2
		α	0.5	0.3409	0.1591	0.3183	0.0557	0.0593	0.0284	0.2070	
		ψ	2.2750	1.9523	0.3227	0.1418	0.1930	0.1747	0.1414	0.5130	
	Cond.	μ	2.5	3.2853	0.7853	0.3141	0.2915	0.3107	0.7016	0.2750	2
		α	0.5	0.3422	0.1578	0.3155	0.0559	0.0596	0.0280	0.2170	
		ψ	2.2750	1.9601	0.3149	0.1384	0.1938	0.1757	0.1367	0.5280	

Note: With the same notations as in Table 1.

Table 22: The results summarized from 1000 replications of the categorical data with $nc = 9$ categories, $N = 200$ individuals, $T = 50$ observations for each individual, and a fixed $y_1 = 0$

		True	Est.	Bias.abs	Bias.rel	SE.emp	SE.avg	MSE	Cover	Code	
P.L.	Exact	μ	2.5	2.6259	0.1259	0.0503	0.0461	0.0461	0.0180	0.2160	2
		α	0.5	0.4747	0.0253	0.0507	0.0087	0.0087	0.0007	0.1680	
		ψ	2.2750	2.2738	0.0012	0.0005	0.0305	0.0322	0.0009	0.9580	
	Cond.	μ	2.5	2.5777	0.0777	0.0311	0.0472	0.0473	0.0083	0.6250	2
		α	0.5	0.4843	0.0157	0.0314	0.0089	0.0090	0.0003	0.5870	
		ψ	2.2750	2.3199	0.0449	0.0197	0.0311	0.0331	0.0030	0.7460	
P.D.	Exact	μ	2.5	2.6273	0.1273	0.0509	0.0463	0.0465	0.0184	0.2160	1
		α	0.5	0.4744	0.0256	0.0513	0.0087	0.0088	0.0007	0.1720	
		ψ	2.2750	2.2874	0.0124	0.0054	0.0307	0.0324	0.0011	0.9510	
	Cond.	μ	2.5	2.6271	0.1271	0.0508	0.0463	0.0465	0.0183	0.2190	2
		α	0.5	0.4744	0.0256	0.0512	0.0087	0.0088	0.0007	0.1740	
		ψ	2.2750	2.2876	0.0126	0.0055	0.0307	0.0324	0.0011	0.9500	

Note: With the same notations as in Table 1.

Results with $y_1 \sim N(0, \psi)$

Table 23: The results summarized from 1000 replications of the categorical data with $n_c = 9$ categories, $N = 50$ individuals, $T = 5$ observations for each individual, and a fixed $y_1 \sim N(0, \psi)$

		True	Est.	Bias.abs	Bias.rel	SE.emp	SE.avg	MSE	Cover	Code	
P.L.	Exact	μ	2.5	2.7244	0.2244	0.0898	0.3084	0.3059	0.1455	0.9160	2
		α	0.5	0.4561	0.0439	0.0877	0.0596	0.0589	0.0055	0.9000	
		ψ	2.2750	2.2075	0.0675	0.0297	0.1886	0.1998	0.0401	0.9330	
	Cond.	μ	2.5	2.6261	0.1261	0.0504	0.3371	0.3399	0.1295	0.9470	2
		α	0.5	0.4757	0.0243	0.0486	0.0642	0.0644	0.0047	0.9470	
		ψ	2.2750	2.2932	0.0182	0.0080	0.2134	0.2294	0.0459	0.9640	
P.D.	Exact	μ	2.5	3.1381	0.6381	0.2552	0.3117	0.3095	0.5044	0.4760	1
		α	0.5	0.3735	0.1265	0.2530	0.0594	0.0586	0.0195	0.4470	
		ψ	2.2750	2.4139	0.1389	0.0611	0.2081	0.2160	0.0626	0.9340	
	Cond.	μ	2.5	3.1368	0.6368	0.2547	0.3122	0.3099	0.5031	0.4750	2
		α	0.5	0.3737	0.1263	0.2526	0.0594	0.0587	0.0195	0.4480	
		ψ	2.2750	2.4151	0.1401	0.0616	0.2081	0.2165	0.0629	0.9370	

Note: With the same notations as in Table 1.

Table 24: The results summarized from 1000 replications of the categorical data with $n_c = 9$ categories, $N = 200$ individuals, $T = 50$ observations for each individual, and a fixed $y_1 \sim N(0, \psi)$

		True	Est.	Bias.abs	Bias.rel	SE.emp	SE.avg	MSE	Cover	Code	
P.L.	Exact	μ	2.5	2.5894	0.0894	0.0357	0.0474	0.0463	0.0102	0.5060	1
		α	0.5	0.4822	0.0178	0.0356	0.0090	0.0088	0.0004	0.4690	
		ψ	2.2750	2.3106	0.0356	0.0157	0.0302	0.0327	0.0022	0.8350	
	Cond.	μ	2.5	2.5785	0.0785	0.0314	0.0481	0.0469	0.0085	0.6190	1
		α	0.5	0.4843	0.0157	0.0313	0.0091	0.0089	0.0003	0.5810	
		ψ	2.2750	2.3210	0.0460	0.0202	0.0306	0.0332	0.0030	0.7410	
P.D.	Exact	μ	2.5	2.6278	0.1278	0.0511	0.0477	0.0466	0.0186	0.2320	1
		α	0.5	0.4745	0.0255	0.0510	0.0091	0.0088	0.0007	0.1860	
		ψ	2.2750	2.3357	0.0607	0.0267	0.0307	0.0330	0.0046	0.5610	
	Cond.	μ	2.5	2.6277	0.1277	0.0511	0.0477	0.0466	0.0186	0.2310	2
		α	0.5	0.4745	0.0255	0.0510	0.0091	0.0088	0.0007	0.1870	
		ψ	2.2750	2.3358	0.0608	0.0267	0.0307	0.0330	0.0046	0.5600	

Note: With the same notations as in Table 1.

Results with $y_1 \sim N\left(\frac{\mu}{1-\alpha}, \frac{\psi}{1-\alpha^2}\right)$

Table 25: The results summarized from 1000 replications of the categorical data with $nc = 9$ categories, $N = 50$ individuals, $T = 5$ observations for each individual, and a fixed $y_1 \sim N\left(\frac{\mu}{1-\alpha}, \frac{\psi}{1-\alpha^2}\right)$

		True	Est.	Bias.abs	Bias.rel	SE.emp	SE.avg	MSE	Cover	Code	
P.L.	Exact	μ	2.5	2.6150	0.1150	0.0460	0.3038	0.3045	0.1055	0.9470	2
		α	0.5	0.4773	0.0227	0.0454	0.0580	0.0586	0.0039	0.9520	
		ψ	2.2750	2.3029	0.0279	0.0123	0.1964	0.2088	0.0394	0.9560	
	Cond.	μ	2.5	2.6147	0.1147	0.0459	0.3191	0.3280	0.1150	0.9460	2
		α	0.5	0.4773	0.0227	0.0454	0.0598	0.0620	0.0041	0.9530	
		ψ	2.2750	2.2954	0.0204	0.0089	0.2152	0.2296	0.0467	0.9570	
P.D.	Exact	μ	2.5	3.0991	0.5991	0.2396	0.3099	0.3092	0.4550	0.5180	2
		α	0.5	0.3804	0.1196	0.2391	0.0582	0.0584	0.0177	0.4780	
		ψ	2.2750	2.5538	0.2788	0.1226	0.2207	0.2285	0.1265	0.8320	
	Cond.	μ	2.5	3.0995	0.5995	0.2398	0.3093	0.3096	0.4551	0.5190	2
		α	0.5	0.3804	0.1196	0.2391	0.0582	0.0585	0.0177	0.4780	
		ψ	2.2750	2.5540	0.2790	0.1226	0.2208	0.2289	0.1266	0.8300	

Note: With the same notations as in Table 1.

Table 26: The results summarized from 1000 replications of the categorical data with $nc = 9$ categories, $N = 200$ individuals, $T = 50$ observations for each individual, and a fixed $y_1 \sim N\left(\frac{\mu}{1-\alpha}, \frac{\psi}{1-\alpha^2}\right)$

		True	Est.	Bias.abs	Bias.rel	SE.emp	SE.avg	MSE	Cover	Code	
P.L.	Exact	μ	2.5	2.5760	0.0760	0.0304	0.0461	0.0464	0.0079	0.6230	1
		α	0.5	0.4848	0.0152	0.0305	0.0087	0.0088	0.0003	0.5950	
		ψ	2.2750	2.3183	0.0433	0.0191	0.0301	0.0328	0.0028	0.7660	
	Cond.	μ	2.5	2.5759	0.0759	0.0304	0.0466	0.0468	0.0079	0.6340	2
		α	0.5	0.4848	0.0152	0.0304	0.0088	0.0088	0.0003	0.5970	
		ψ	2.2750	2.3184	0.0434	0.0191	0.0304	0.0331	0.0028	0.7720	
P.D.	Exact	μ	2.5	2.6247	0.1247	0.0499	0.0461	0.0466	0.0177	0.2370	1
		α	0.5	0.4750	0.0250	0.0499	0.0087	0.0088	0.0007	0.1910	
		ψ	2.2750	2.3467	0.0717	0.0315	0.0304	0.0332	0.0061	0.4010	
	Cond.	μ	2.5	2.6247	0.1247	0.0499	0.0461	0.0466	0.0177	0.2370	2
		α	0.5	0.4750	0.0250	0.0499	0.0087	0.0088	0.0007	0.1910	
		ψ	2.2750	2.3467	0.0717	0.0315	0.0304	0.0332	0.0061	0.3970	

Note: With the same notations as in Table 1.