Appendix

Expanded Simulation Results

This appendix contains more complete versions of the tables in "Comparing the Performance of Improved Classify-Analyze Approaches for Distal Outcomes in Latent Profile Analysis" by Dziak, Bray, Zhang, Zhang and Lanza. For example, to save space, the paper omitted the medium effect size scenarios for all distributions, and the good measurement quality scenarios for non-binary distributions. All scenarios are considered in this appendix, intended as an online supplemental document. Tables A1 through A3 present absolute bias, root mean squared error (RMSE), and coverage, each averaged across classes, for the binary distribution scenarios. Tables A4 through A6, A7 through A9, and A10 through A12 present analogous information for the homoscedastic normal, heteroscedastic normal, and exponential skewed distribution scenarios. Table A13 through A16 provide class-specific bias information for each distribution scenarios, but focuses on large effect sizes and even class proportions for simplicity; it is presented as an illustration of how some biases are conservative and some are anticonservative.

Table A1

Mean Absolute Bias Across Classes for Binary Outcome Probabilities

		Low Measurement Quality (Ramaswamy Entropy ≈.7)					
Class Proportions		Even			Uneven		
Effect Size		Small	Medium	Large	Small	Medium	Large
Unadjusted	Modal	0.004	0.014	0.020	0.005	0.019	0.030
	Proportional	0.006	0.020	0.029	0.008	0.031	0.047
ML	Modal	0.001	0.002	0.001	0.002	0.002	0.005
	Proportional	0.001	0.001	0.001	0.002	0.002	0.004
BCH	Modal	0.001	0.002	0.001	0.002	0.002	0.004
	Proportional	0.001	0.001	0.001	0.002	0.002	0.003
Inclusive	Modal	0.001	0.005	0.007	0.003	0.009	0.012
	Proportional	0.001	0.001	0.001	0.002	0.001	0.002
Oracle		0.001	0.000	0.001	0.001	0.001	0.000
		High Measurement Quality (Ramaswamy Entropy ≈.85)					
Class Proportions		Even			Uneven		
Effect Size		Small	Medium	Large	Small	Medium	Large
Unadjusted	Modal	0.002	0.009	0.012	0.004	0.012	0.018
	Proportional	0.002	0.012	0.018	0.005	0.018	0.028
ML	Modal	0.001	0.001	0.001	0.001	0.001	0.002
	Proportional	0.001	0.001	0.001	0.001	0.001	0.002
BCH	Modal	0.001	0.001	0.001	0.001	0.001	0.002
	Proportional	0.001	0.001	0.001	0.001	0.001	0.002
Inclusive	Modal	0.002	0.002	0.003	0.000	0.004	0.006
	Proportional	0.001	0.001	0.001	0.001	0.001	0.001
Oracle		0.001	0.000	0.000	0.001	0.000	0.000

Table A2

Root Mean Squared Error Across Classes for Binary Outcome Probabilities

		Low Measurement Quality (Ramaswamy Entropy ≈.73)					
Class Proportions		Even			Uneven		
Effect Size		Small	Medium	Large	Small	Medium	Large
Unadjusted	Modal	0.028	0.032	0.036	0.036	0.043	0.048
	Proportional	0.026	0.034	0.043	0.032	0.047	0.060
ML	Modal	0.033	0.032	0.031	0.043	0.044	0.041
	Proportional	0.032	0.030	0.030	0.041	0.042	0.039
BCH	Modal	0.033	0.032	0.031	0.043	0.044	0.041
	Proportional	0.032	0.030	0.030	0.041	0.042	0.039
Inclusive	Modal	0.035	0.034	0.033	0.047	0.048	0.044
	Proportional	0.032	0.031	0.030	0.042	0.043	0.039
Oracle		0.027	0.026	0.024	0.036	0.034	0.030
		High Measurement Quality (Ramaswamy Entropy ≈.84)					
Class Proportions		Even			Uneven		
Effect Size		Small	Medium	Large	Small	Medium	Large
Unadjusted	Modal	0.027	0.029	0.029	0.035	0.035	0.037
	Proportional	0.026	0.029	0.032	0.033	0.036	0.042
ML	Modal	0.030	0.029	0.027	0.039	0.036	0.034
	Proportional	0.029	0.028	0.027	0.038	0.035	0.034
BCH	Modal	0.030	0.029	0.027	0.039	0.036	0.034
	Proportional	0.029	0.028	0.027	0.038	0.035	0.034
Inclusive	Modal	0.030	0.030	0.028	0.040	0.038	0.035
	Proportional	0.029	0.029	0.027	0.038	0.036	0.034
Oracle		0.027	0.026	0.024	0.035	0.032	0.029

Table A3

Mean Confidence Interval Coverage Across Classes for Binary Outcome Probabilities

		Low Measurement Quality (Ramaswamy Entropy ≈.73)					
Class Proportions		Even			Uneven		
Effect Size		Small	Medium	Large	Small	Medium	Large
Unadjusted	Modal	0.939	0.900	0.814	0.945	0.886	0.795
	Proportional	0.960	0.874	0.684	0.965	0.844	0.644
ML	Modal	0.946	0.938	0.936	0.946	0.937	0.932
	Proportional	0.947	0.940	0.933	0.949	0.937	0.930
BCH	Modal	0.946	0.939	0.936	0.946	0.937	0.933
	Proportional	0.947	0.940	0.933	0.949	0.936	0.930
Inclusive	Modal	0.880	0.862	0.823	0.882	0.846	0.820
	Proportional	0.908	0.893	0.882	0.905	0.883	0.877
Oracle		0.952	0.944	0.950	0.943	0.945	0.949
		High Measurement Quality (Ramaswamy Entropy ≈.84)					
Class Proportions		Even			Uneven		
Effect Size		Small	Medium	Large	Small	Medium	Large
Unadjusted	Modal	0.951	0.928	0.902	0.949	0.939	0.905
	Proportional	0.962	0.924	0.868	0.960	0.935	0.866
ML	Modal	0.953	0.945	0.944	0.949	0.951	0.943
	Proportional	0.951	0.944	0.943	0.948	0.953	0.946
BCH	Modal	0.953	0.945	0.945	0.949	0.951	0.943
	Proportional	0.950	0.944	0.943	0.948	0.953	0.945
Inclusive	Modal	0.923	0.914	0.897	0.916	0.918	0.907
	Proportional	0.933	0.925	0.918	0.931	0.933	0.925
Oracle		0.952	0.943	0.946	0.950	0.955	0.958

Table A4

Mean Absolute Bias Across Classes for Homoskedastic Normal Outcome Means

		Low Measurement Quality (Ramaswamy Entropy ≈.73)					
Class Proportions		Even			Uneven		
Effect Size		Small	Medium	Large	Small	Medium	Large
Unadjusted	Modal	0.006	0.013	0.020	0.009	0.020	0.029
	Proportional	0.009	0.019	0.029	0.015	0.031	0.047
ML	Modal	0.002	0.001	0.001	0.003	0.003	0.003
	Proportional	0.003	0.002	0.001	0.002	0.002	0.003
BCH	Modal	0.002	0.001	0.001	0.003	0.003	0.003
	Proportional	0.002	0.001	0.001	0.003	0.003	0.003
Inclusive	Modal	0.005	0.006	0.008	0.005	0.010	0.015
	Proportional	0.002	0.003	0.001	0.002	0.002	0.001
Quadratic	Modal	0.005	0.006	0.008	0.005	0.010	0.015
	Proportional	0.002	0.003	0.001	0.002	0.003	0.001
Oracle		0.002	0.002	0.001	0.002	0.001	0.001
		High Measurement Quality (Ramaswamy Entropy ≈.84)					
Class Proportions		Even			Uneven		
Effect Size		Small	Medium	Large	Small	Medium	Large
Unadjusted	Modal	0.004	0.009	0.012	0.006	0.012	0.018
	Proportional	0.006	0.012	0.017	0.010	0.019	0.028
ML	Modal	0.003	0.001	0.001	0.002	0.002	0.004
	Proportional	0.002	0.001	0.000	0.002	0.001	0.003
BCH	Modal	0.003	0.001	0.001	0.002	0.002	0.004
	Proportional	0.003	0.001	0.001	0.002	0.002	0.004
Inclusive	Modal	0.004	0.002	0.003	0.002	0.004	0.006
	Proportional	0.002	0.001	0.000	0.002	0.002	0.002
Quadratic	Modal	0.004	0.002	0.003	0.002	0.004	0.006
	Proportional	0.002	0.001	0.000	0.002	0.002	0.002
Oracle		0.002	0.001	0.000	0.002	0.001	0.003

Table A5

Root Mean Squared Error Across Classes for Homoskedastic Normal Outcome Means

		Low Measurement Quality (Ramaswamy Entropy ≈.73)					
Class Proportions		Even			Uneven		
Effect Size		Small	Medium	Large	Small	Medium	Large
Unadjusted	Modal	0.055	0.057	0.060	0.074	0.079	0.081
	Proportional	0.050	0.055	0.061	0.065	0.073	0.082
ML	Modal	0.065	0.065	0.064	0.087	0.090	0.088
	Proportional	0.063	0.063	0.062	0.083	0.085	0.085
BCH	Modal	0.065	0.065	0.064	0.087	0.090	0.088
	Proportional	0.065	0.065	0.064	0.087	0.090	0.088
Inclusive	Modal	0.069	0.069	0.068	0.094	0.099	0.097
	Proportional	0.064	0.063	0.062	0.085	0.087	0.086
Quadratic	Modal	0.069	0.069	0.068	0.094	0.099	0.097
	Proportional	0.064	0.063	0.063	0.085	0.088	0.086
Oracle		0.053	0.055	0.054	0.071	0.073	0.071
		High Measurement Quality (Ramaswamy Entropy ≈.84)					
Class Proportions		Even			Uneven		
Effect Size		Small	Medium	Large	Small	Medium	Large
Unadjusted	Modal	0.055	0.056	0.058	0.072	0.074	0.075
	Proportional	0.052	0.054	0.056	0.067	0.070	0.073
ML	Modal	0.060	0.060	0.061	0.079	0.079	0.079
	Proportional	0.059	0.059	0.060	0.077	0.078	0.077
BCH	Modal	0.060	0.060	0.061	0.079	0.079	0.079
	Proportional	0.060	0.060	0.061	0.079	0.079	0.079
Inclusive	Modal	0.061	0.061	0.062	0.082	0.083	0.082
	Proportional	0.059	0.059	0.060	0.078	0.079	0.078
Quadratic	Modal	0.061	0.062	0.062	0.082	0.083	0.082
	Proportional	0.059	0.059	0.060	0.078	0.079	0.078
Oracle		0.055	0.055	0.055	0.072	0.071	0.071

Table A6

Mean Confidence Interval Coverage Across Classes for Homoskedastic Normal Outcome Means

		Low Measurement Quality (Ramaswamy Entropy ≈.73)					
Class Proportions		Even			Uneven		
Effect Size		Small	Medium	Large	Small	Medium	Large
Unadjusted	Modal	0.952	0.938	0.928	0.954	0.932	0.923
	Proportional	0.965	0.947	0.927	0.971	0.945	0.917
ML	Modal	0.953	0.946	0.953	0.955	0.943	0.945
	Proportional	0.951	0.946	0.951	0.959	0.943	0.946
BCH	Modal	0.953	0.948	0.954	0.955	0.944	0.946
	Proportional	0.953	0.948	0.954	0.955	0.944	0.946
Inclusive	Modal	0.885	0.875	0.887	0.885	0.872	0.864
	Proportional	0.906	0.903	0.912	0.916	0.902	0.903
Quadratic	Modal	0.879	0.875	0.882	0.882	0.868	0.861
	Proportional	0.905	0.906	0.913	0.911	0.901	0.903
Oracle		0.954	0.946	0.955	0.952	0.947	0.949
		High Measurement Quality (Ramaswamy Entropy ≈.84)					
Class Proportions		Even			Uneven		
Effect Size		Small	Medium	Large	Small	Medium	Large
Unadjusted	Modal	0.949	0.946	0.933	0.951	0.941	0.939
	Proportional	0.962	0.957	0.942	0.961	0.949	0.939
ML	Modal	0.949	0.949	0.940	0.951	0.947	0.947
	Proportional	0.949	0.949	0.944	0.953	0.945	0.948
BCH	Modal	0.950	0.948	0.940	0.951	0.947	0.947
	Proportional	0.950	0.948	0.940	0.951	0.947	0.947
Inclusive	Modal	0.919	0.915	0.914	0.924	0.913	0.915
	Proportional	0.927	0.927	0.925	0.933	0.923	0.931
Quadratic	Modal	0.915	0.910	0.915	0.921	0.913	0.916
	Proportional	0.927	0.926	0.926	0.932	0.921	0.931
Oracle		0.952	0.949	0.945	0.950	0.950	0.948

Table A7

Mean Absolute Bias Across Classes for Heteroskedastic Normal Outcome Means

		Low Measurement Quality (Ramaswamy Entropy ≈.73)					
Class Proportions		Even			Uneven		
Effect Size		Small	Medium	Large	Small	Medium	Large
Unadjusted	Modal	0.014	0.031	0.040	0.015	0.040	0.059
	Proportional	0.019	0.042	0.057	0.027	0.064	0.093
ML	Modal	0.125	0.246	0.367	0.111	0.228	0.338
	Proportional	0.096	0.195	0.307	0.390	0.615	0.724
BCH	Modal	0.002	0.006	0.001	0.003	0.006	0.008
	Proportional	0.002	0.006	0.001	0.003	0.006	0.008
Inclusive	Modal	0.281	0.532	0.487	0.059	0.127	0.153
	Proportional	0.273	0.515	0.475	0.052	0.113	0.134
Quadratic	Modal	0.007	0.009	0.015	0.015	0.016	0.027
	Proportional	0.001	0.003	0.002	0.005	0.002	0.002
Oracle		0.001	0.003	0.002	0.005	0.001	0.003
		High Measurement Quality (Ramaswamy Entropy ≈.84)					
Class Proportions		Even			Uneven		
Effect Size		Small	Medium	Large	Small	Medium	Large
Unadjusted	Modal	0.012	0.014	0.025	0.006	0.026	0.036
	Proportional	0.016	0.022	0.035	0.014	0.040	0.056
ML	Modal	0.126	0.251	0.369	0.114	0.229	0.365
	Proportional	0.030	0.074	0.113	0.327	0.508	0.625
BCH	Modal	0.005	0.003	0.003	0.005	0.005	0.004
	Proportional	0.005	0.003	0.003	0.005	0.005	0.004
Inclusive	Modal	0.011	0.028	0.036	0.047	0.057	0.069
	Proportional	0.012	0.032	0.041	0.044	0.056	0.068
Quadratic	Modal	0.004	0.007	0.006	0.010	0.004	0.010
	Proportional	0.005	0.003	0.001	0.006	0.004	0.003
Oracle		0.005	0.003	0.000	0.006	0.005	0.002

Table A8

Root Mean Squared Error Across Classes for Heteroskedastic Normal Outcome Means

		Low Measurement Quality (Ramaswamy Entropy ≈.73)					
Class Proportions		Even			Uneven		
Effect Size		Small	Medium	Large	Small	Medium	Large
Unadjusted	Modal	0.106	0.112	0.120	0.180	0.180	0.190
	Proportional	0.099	0.110	0.123	0.157	0.167	0.184
ML	Modal	0.192	0.356	0.519	0.356	0.466	0.595
	Proportional	0.203	0.285	0.392	1.182	1.138	1.118
BCH	Modal	0.121	0.123	0.126	0.209	0.204	0.210
	Proportional	0.121	0.123	0.126	0.209	0.204	0.210
Inclusive	Modal	1.633	1.688	1.600	1.334	1.191	1.041
	Proportional	1.552	1.605	1.524	1.251	1.112	0.970
Quadratic	Modal	0.112	0.114	0.119	0.204	0.205	0.209
	Proportional	0.108	0.110	0.115	0.190	0.190	0.193
Oracle		0.104	0.106	0.109	0.180	0.183	0.183
		High Measurement Quality (Ramaswamy Entropy ≈.84)					
Class Proportions		Even			Uneven		
Effect Size		Small	Medium	Large	Small	Medium	Large
Unadjusted	Modal	0.103	0.106	0.110	0.175	0.185	0.187
	Proportional	0.099	0.102	0.109	0.164	0.174	0.180
ML	Modal	0.206	0.372	0.510	0.274	0.414	0.559
	Proportional	0.122	0.147	0.180	0.999	0.984	1.031
BCH	Modal	0.110	0.112	0.113	0.191	0.199	0.200
	Proportional	0.110	0.112	0.113	0.191	0.199	0.200
Inclusive	Modal	0.115	0.121	0.126	0.343	0.338	0.308
	Proportional	0.112	0.118	0.124	0.324	0.319	0.291
Quadratic	Modal	0.107	0.109	0.110	0.191	0.198	0.199
	Proportional	0.105	0.107	0.108	0.185	0.192	0.192
Oracle		0.102	0.104	0.105	0.182	0.187	0.189

Table A9

Mean Confidence Interval Coverage Across Classes for Heteroskedastic Normal Outcome Means

		Low Measurement Quality (Ramaswamy Entropy ≈.73)					
Class Proportions		Even			Uneven		
Effect Size		Small	Medium	Large	Small	Medium	Large
Unadjusted	Modal	0.945	0.917	0.886	0.946	0.915	0.870
	Proportional	0.959	0.919	0.855	0.957	0.905	0.823
ML	Modal	0.473	0.223	0.174	0.478	0.269	0.206
	Proportional	0.871	0.630	0.366	0.260	0.220	0.207
BCH	Modal	0.951	0.947	0.945	0.951	0.956	0.940
	Proportional	0.951	0.947	0.945	0.951	0.956	0.940
Inclusive	Modal	0.362	0.276	0.298	0.484	0.502	0.558
	Proportional	0.378	0.274	0.295	0.487	0.500	0.538
Quadratic	Modal	0.898	0.888	0.878	0.902	0.899	0.876
	Proportional	0.922	0.918	0.905	0.919	0.918	0.914
Oracle		0.955	0.950	0.951	0.956	0.950	0.951
		High Measurement Quality (Ramaswamy Entropy ≈.84)					
Class Proportions		Even			Uneven		
Effect Size		Small	Medium	Large	Small	Medium	Large
Unadjusted	Modal	0.949	0.937	0.935	0.954	0.939	0.923
	Proportional	0.959	0.947	0.926	0.958	0.942	0.903
ML	Modal	0.428	0.230	0.212	0.475	0.328	0.213
	Proportional	0.929	0.846	0.726	0.485	0.424	0.355
BCH	Modal	0.953	0.948	0.952	0.955	0.954	0.945
	Proportional	0.953	0.948	0.952	0.955	0.954	0.945
Inclusive	Modal	0.926	0.902	0.894	0.836	0.843	0.846
	Proportional	0.939	0.914	0.889	0.844	0.848	0.843
Quadratic	Modal	0.924	0.926	0.915	0.932	0.922	0.917
	Proportional	0.935	0.935	0.930	0.938	0.932	0.922
Oracle		0.953	0.948	0.954	0.953	0.945	0.941

Table A10

Mean Absolute Bias Across Classes for Exponential Skewed Outcome Means

		Low Measurement Quality (Ramaswamy Entropy ≈.73)					
Class Proportions		Even			Uneven		
Effect Size		Small	Medium	Large	Small	Medium	Large
Unadjusted	Modal	0.007	0.017	0.028	0.011	0.025	0.040
	Proportional	0.010	0.025	0.039	0.016	0.040	0.063
ML	Modal	0.002	0.017	0.044	0.009	0.104	0.329
	Proportional	0.005	0.033	0.077	0.049	0.347	0.767
BCH	Modal	0.002	0.002	0.003	0.003	0.005	0.008
	Proportional	0.002	0.002	0.003	0.003	0.005	0.008
Inclusive	Modal	0.003	0.007	0.009	0.004	0.011	0.018
	Proportional	0.002	0.003	0.003	0.001	0.003	0.006
Quadratic	Modal	0.003	0.006	0.008	0.005	0.010	0.019
	Proportional	0.002	0.003	0.002	0.002	0.003	0.006
Oracle		0.001	0.002	0.002	0.002	0.003	0.003
		High Measurement Quality (Ramaswamy Entropy ≈.84)					
Class Proportions		Even			Uneven		
Effect Size		Small	Medium	Large	Small	Medium	Large
Unadjusted	Modal	0.005	0.009	0.015	0.005	0.013	0.023
	Proportional	0.007	0.013	0.023	0.008	0.021	0.036
ML	Modal	0.002	0.011	0.021	0.004	0.027	0.083
	Proportional	0.003	0.017	0.034	0.008	0.070	0.276
BCH	Modal	0.002	0.002	0.001	0.000	0.002	0.003
	Proportional	0.002	0.002	0.001	0.000	0.002	0.003
Inclusive	Modal	0.002	0.004	0.004	0.003	0.008	0.010
	Proportional	0.002	0.002	0.001	0.001	0.003	0.003
Quadratic	Modal	0.002	0.004	0.004	0.003	0.008	0.009
	Proportional	0.002	0.002	0.001	0.001	0.003	0.002
Oracle		0.002	0.002	0.001	0.002	0.003	0.003

Table A11

Root Mean Squared Error Across Classes for Exponential Skewed Outcome Means

		Low Measurement Quality (Ramaswamy Entropy ≈.73)					
Class Proportions		Even			Uneven		
Effect Size		Small	Medium	Large	Small	Medium	Large
Unadjusted	Modal	0.061	0.074	0.088	0.083	0.103	0.127
	Proportional	0.056	0.070	0.087	0.074	0.097	0.123
ML	Modal	0.072	0.086	0.105	0.123	0.435	0.841
	Proportional	0.070	0.089	0.121	0.318	0.912	1.413
BCH	Modal	0.072	0.084	0.096	0.098	0.118	0.141
	Proportional	0.072	0.084	0.096	0.098	0.118	0.141
Inclusive	Modal	0.076	0.088	0.098	0.107	0.130	0.154
	Proportional	0.070	0.081	0.091	0.097	0.116	0.136
Quadratic	Modal	0.075	0.088	0.098	0.107	0.131	0.152
	Proportional	0.070	0.081	0.092	0.097	0.117	0.136
Oracle		0.060	0.070	0.077	0.083	0.100	0.117
		High Measurement Quality (Ramaswamy Entropy ≈.84)					
Class Proportions		Even			Uneven		
Effect Size		Small	Medium	Large	Small	Medium	Large
Unadjusted	Modal	0.060	0.072	0.083	0.083	0.104	0.121
	Proportional	0.057	0.069	0.081	0.077	0.097	0.115
ML	Modal	0.065	0.078	0.091	0.099	0.161	0.294
	Proportional	0.064	0.078	0.094	0.105	0.314	0.744
BCH	Modal	0.065	0.077	0.088	0.091	0.114	0.130
	Proportional	0.065	0.077	0.088	0.091	0.114	0.130
Inclusive	Modal	0.067	0.078	0.089	0.095	0.120	0.135
	Proportional	0.064	0.076	0.086	0.090	0.112	0.127
Quadratic	Modal	0.067	0.078	0.089	0.094	0.121	0.135
	Proportional	0.064	0.076	0.086	0.090	0.113	0.127
Oracle		0.059	0.071	0.079	0.082	0.102	0.117

Table A12

Mean Confidence Interval Coverage Across Classes for Exponential Skewed Outcome Means

		Low Measurement Quality (Ramaswamy Entropy ≈.73)					
Class Proportions		Even			Uneven		
Effect Size		Small	Medium	Large	Small	Medium	Large
Unadjusted	Modal	0.944	0.929	0.914	0.938	0.928	0.903
	Proportional	0.966	0.941	0.914	0.957	0.930	0.891
ML	Modal	0.944	0.932	0.891	0.936	0.896	0.764
	Proportional	0.945	0.908	0.800	0.912	0.726	0.472
BCH	Modal	0.946	0.945	0.939	0.942	0.940	0.937
	Proportional	0.946	0.945	0.939	0.942	0.940	0.937
Inclusive	Modal	0.876	0.873	0.874	0.875	0.874	0.872
	Proportional	0.906	0.902	0.903	0.907	0.902	0.904
Quadratic	Modal	0.876	0.874	0.868	0.880	0.868	0.871
	Proportional	0.902	0.901	0.896	0.903	0.895	0.901
Oracle		0.947	0.949	0.955	0.942	0.941	0.942
		High Measurement Quality (Ramaswamy Entropy ≈.84)					
Class Proportions		Even			Uneven		
Effect Size		Small	Medium	Large	Small	Medium	Large
Unadjusted	Modal	0.942	0.942	0.938	0.942	0.933	0.928
	Proportional	0.955	0.953	0.946	0.961	0.949	0.932
ML	Modal	0.943	0.938	0.934	0.944	0.932	0.921
	Proportional	0.942	0.936	0.915	0.942	0.924	0.814
BCH	Modal	0.945	0.943	0.943	0.948	0.940	0.939
	Proportional	0.945	0.943	0.943	0.948	0.940	0.939
Inclusive	Modal	0.918	0.908	0.910	0.908	0.909	0.910
	Proportional	0.926	0.920	0.926	0.924	0.924	0.925
Quadratic	Modal	0.917	0.910	0.912	0.912	0.907	0.910
	Proportional	0.925	0.922	0.926	0.922	0.923	0.924
Oracle		0.949	0.946	0.948	0.950	0.941	0.946

Table A13

Class-Specific Bias Information for Binary Distribution Scenarios

	Class 1	Class 2	Class 3
True Proportions	0.800	0.500	0.200
	Poor Measurement Quality		
Unadjusted Modal	-0.029	-0.002	0.030
Unadjusted Proportional	-0.043	-0.001	0.043
ML Modal	-0.001	-0.002	0.002
ML Proportional	-0.001	-0.001	0.001
BCH Modal	-0.001	-0.002	0.001
BCH Proportional	0.000	-0.001	0.001
Inclusive Modal	0.010	-0.002	-0.010
Inclusive Proportional	0.001	-0.002	0.000
	Good Measurement Quality		
Unadjusted Modal	-0.018	-0.001	0.018
Unadjusted Proportional	-0.026	-0.001	0.026
ML Modal	-0.001	-0.001	0.001
ML Proportional	-0.001	-0.001	0.001
BCH Modal	-0.001	-0.001	0.001
BCH Proportional	-0.001	-0.001	0.001
Inclusive Modal	0.004	-0.001	-0.004
Inclusive Proportional	0.000	-0.001	0.000

Note: For simplicity, in this table results are shown only for scenarios with large effect sizes and even class proportions.

Table A14

Class-Specific Bias Information for Homoscedastic Normal Distribution Scenarios

	Class 1	Class 2	Class 3
True Mean	0.300	0.000	-0.300
	Poor Measurement Quality		
Unadjusted Modal	-0.031	-0.001	0.030
Unadjusted Proportional	-0.043	-0.001	0.043
ML Modal	-0.002	-0.001	0.001
ML Proportional	-0.001	-0.002	0.001
BCH Modal	-0.002	-0.001	0.001
Inclusive Modal	0.011	-0.002	-0.011
Inclusive Proportional	0.000	-0.002	-0.001
Quadratic Modal	0.011	-0.001	-0.011
Quadratic Proportional	0.000	-0.002	-0.001
	Good Measurement Quality		
Unadjusted Modal	-0.017	0.000	0.018
Unadjusted Proportional	-0.025	0.000	0.025
ML Modal	0.000	-0.001	0.001
ML Proportional	0.000	0.000	0.000
BCH Modal	0.000	-0.001	0.001
Inclusive Modal	0.005	-0.001	-0.004
Inclusive Proportional	0.000	0.000	0.000
Quadratic Modal	0.005	-0.001	-0.004
Quadratic Proportional	0.000	0.000	0.000

Note: For simplicity, in this table results are shown only for scenarios with large effect sizes and even class proportions. Results for proportional BCH are not shown because Latent GOLD appears to give identical results for modal and proportional BCH when the distal outcome variable is continuous.

Table A15

Class-Specific Bias Information for Heteroskedastic Normal Distribution Scenarios

	Class 1	Class 2	Class 3
True Mean	0.600	0.000	-0.600
	Poor Measurement Quality		
Unadjusted Modal	-0.059	0.000	0.060
Unadjusted Proportional	-0.084	-0.001	0.086
ML Modal	-0.513	-0.039	0.550
ML Proportional	0.360	-0.429	0.133
BCH Modal	-0.002	0.000	0.003
Inclusive Modal	-0.969	0.370	0.122
Inclusive Proportional	-0.930	0.363	0.133
Quadratic Modal	0.014	0.012	-0.018
Quadratic Proportional	0.004	-0.003	0.000
	Good Measurement Quality		
Unadjusted Modal	-0.038	0.001	0.034
Unadjusted Proportional	-0.053	0.001	0.050
ML Modal	-0.544	-0.009	0.554
ML Proportional	0.102	-0.164	0.072
BCH Modal	-0.005	0.002	0.001
Inclusive Modal	0.033	-0.052	0.023
Inclusive Proportional	0.027	-0.060	0.036
Quadratic Modal	0.003	0.008	-0.009
Quadratic Proportional	-0.002	0.001	0.000

Note: For simplicity, in this table results are shown only for scenarios with large effect sizes and even class proportions. Results for proportional BCH are not shown because Latent GOLD appears to give identical results for modal and proportional BCH when the distal outcome variable is continuous.

Table A16

Class-Specific Bias Information for Exponential Skewed Distribution Scenarios

	Class 1	Class 2	Class 3
True Mean	1.800	1.400	1.000
	Poor Measurement Quality		
Unadjusted Modal	-0.039	-0.002	0.044
Unadjusted Proportional	-0.056	-0.001	0.060
ML Modal	0.032	-0.064	0.037
ML Proportional	0.063	-0.112	0.055
BCH Modal	0.000	-0.004	0.006
Inclusive Modal	0.016	-0.003	-0.009
Inclusive Proportional	0.002	-0.003	0.004
Quadratic Modal	0.014	-0.002	-0.008
Quadratic Proportional	0.001	-0.001	0.004
	Good Measurement Quality		
Unadjusted Modal	-0.023	-0.002	0.022
Unadjusted Proportional	-0.034	-0.001	0.033
ML Modal	0.014	-0.032	0.016
ML Proportional	0.025	-0.052	0.025
BCH Modal	0.000	-0.002	0.000
Inclusive Modal	0.005	0.000	-0.007
Inclusive Proportional	-0.001	0.000	-0.001
Quadratic Modal	0.005	0.000	-0.006
Quadratic Proportional	-0.001	0.000	-0.001

Note: For simplicity, in this table results are shown only for scenarios with large effect sizes and even class proportions. Results for proportional BCH are not shown because Latent GOLD appears to give identical results for modal and proportional BCH when the distal outcome variable is continuous.