

Supplementary Table 1. Empirical power (%) of tests for equality of three means with a Normal (0, 1) error distribution

Alternative			Parametric tests					Parametric tests based on INT					Rank-based tests				
Model	δ	p	F (2 df)	T _{ADD}	T _{DOM}	T _{REC}	MAX3	F (2 df)	T _{ADD}	T _{DOM}	T _{REC}	MAX3	KW	MJT	FW _{DOM}	FW _{REC}	MAX3
Additive	0.2	0.03	14.88	19.27	19.02	5.96	15.41	14.88	19.24	19.00	5.96	15.42	13.36	18.61	18.41	4.71	13.18
		0.05	21.33	27.64	27.06	6.93	22.42	21.30	27.64	27.06	6.93	22.41	20.25	26.65	26.18	6.56	21.06
		0.1	37.76	47.29	45.31	12.75	40.48	37.74	47.30	45.29	12.75	40.46	35.97	45.58	43.61	12.24	38.65
		0.2	61.30	71.50	66.47	30.86	65.47	61.28	71.50	66.41	30.80	65.42	59.26	69.46	64.45	29.73	63.33
		0.3	73.78	82.43	74.60	50.34	77.74	73.73	82.41	74.57	50.26	77.70	71.51	80.67	72.50	48.43	75.66
		0.4	79.79	87.24	76.72	64.76	83.51	79.78	87.21	76.70	64.74	83.46	77.78	85.74	74.78	62.65	81.74
		0.5	81.35	88.54	73.15	73.21	84.94	81.29	88.48	73.11	73.18	84.88	79.50	87.00	71.08	71.25	83.14
Dominant	0.14	0.03	24.29	31.08	31.57	5.34	24.84	24.23	31.06	31.56	5.34	24.80	22.81	30.00	30.36	4.24	22.54
		0.05	36.33	44.95	45.94	5.90	37.56	36.32	44.89	45.90	5.93	37.57	34.86	43.46	44.26	5.61	35.83
		0.1	58.58	66.45	68.91	7.97	60.73	58.53	66.38	68.89	7.94	60.65	56.43	64.58	67.00	7.72	58.47
		0.2	77.03	80.68	85.04	12.89	79.08	77.01	80.68	85.04	12.88	79.07	74.95	78.97	83.41	12.56	77.06
		0.3	80.50	80.78	87.72	15.98	82.38	80.47	80.78	87.70	15.97	82.35	78.63	79.14	86.32	15.65	80.49
		0.4	77.09	73.93	85.13	16.36	79.01	77.06	73.91	85.15	16.35	79.00	75.07	71.91	83.50	15.87	76.95
		0.5	67.51	59.73	77.19	14.43	69.65	67.52	59.74	77.10	14.42	69.59	65.35	57.72	75.20	13.94	67.41
Recessive	0.15	0.03	5.26	5.00	5.00	5.48	5.27	5.25	4.98	5.00	5.47	5.25	3.85	5.01	5.00	4.32	3.41
		0.05	5.74	5.14	5.06	6.17	5.69	5.72	5.16	5.03	6.18	5.70	5.25	5.12	4.97	5.82	5.25
		0.1	8.70	5.93	5.25	10.39	8.62	8.74	5.94	5.25	10.36	8.57	8.39	5.82	5.18	9.98	8.25
		0.2	19.83	11.73	6.42	25.79	20.27	19.82	11.77	6.44	25.72	20.28	18.98	11.40	6.30	24.82	19.29
		0.3	38.62	25.65	9.08	48.60	40.02	38.62	25.64	9.09	48.57	39.96	37.14	24.64	8.88	46.62	38.27
		0.4	58.91	46.29	12.84	68.99	60.86	58.87	46.28	12.80	68.93	60.86	56.74	44.46	12.48	67.01	58.56
		0.5	74.41	65.98	15.98	82.73	76.32	74.38	65.94	15.99	82.70	76.25	72.26	63.99	15.61	81.14	74.18
Umbrella	0.15	0.03	26.89	32.91	34.40	4.89	26.87	26.91	32.94	34.34	4.92	26.83	25.53	31.78	33.11	3.86	24.49
		0.05	40.30	46.03	49.19	5.00	39.89	40.32	46.02	49.13	4.98	39.88	38.65	44.49	47.45	4.68	38.02
		0.1	63.02	62.21	70.21	5.17	60.84	62.99	62.13	70.17	5.19	60.82	61.02	60.21	68.30	5.11	58.61
		0.2	80.62	62.22	81.44	7.29	74.01	80.60	62.16	81.41	7.26	74.01	78.59	60.20	79.79	7.20	71.82
		0.3	85.15	41.04	78.75	14.26	73.28	85.08	41.03	78.67	14.27	73.21	83.49	39.52	76.82	13.96	71.01
		0.4	85.89	15.22	67.42	28.94	67.64	85.84	15.21	67.36	28.91	67.60	84.19	14.77	65.50	27.83	65.36
		0.5	86.09	4.76	49.05	49.02	64.63	86.06	4.75	49.02	49.02	64.59	84.39	4.79	47.39	47.25	62.23

Note: Based on 100,000 simulations. Maximum standard error of estimates 0.16%. Bold face indicates the highest power across each row and within each class of tests (parametric tests, rank tests, and parametric tests based on INT).

Abbreviations: KW – Kruskal-Wallis test

Supplementary Table 2. Empirical power (%) of tests for equality of three means under additive genetic model and different error distributions

Error			Parametric tests					Parametric tests based on INT					Rank-based tests				
Distribution	δ	p	F (2 df)	T _{ADD}	T _{DOM}	T _{REC}	MAX3	F (2 df)	T _{ADD}	T _{DOM}	T _{REC}	MAX3	KW	MJT	FW _{DOM}	FW _{REC}	MAX3
Normal ($\mu = 0$, $\sigma = 1$)	0.2	0.03	14.88	19.27	19.02	5.96	15.41	14.88	19.24	19.00	5.96	15.42	13.36	18.61	18.41	4.71	13.18
		0.05	21.33	27.64	27.06	6.93	22.42	21.30	27.64	27.06	6.93	22.41	20.25	26.65	26.18	6.56	21.06
		0.1	37.76	47.29	45.31	12.75	40.48	37.74	47.30	45.29	12.75	40.46	35.97	45.58	43.61	12.24	38.65
		0.2	61.30	71.50	66.47	30.86	65.47	61.28	71.50	66.41	30.80	65.42	59.26	69.46	64.45	29.73	63.33
		0.3	73.78	82.43	74.60	50.34	77.74	73.73	82.41	74.57	50.26	77.70	71.51	80.67	72.50	48.43	75.66
		0.4	79.79	87.24	76.72	64.76	83.51	79.78	87.21	76.70	64.74	83.46	77.78	85.74	74.78	62.65	81.74
		0.5	81.35	88.54	73.15	73.21	84.94	81.29	88.48	73.11	73.18	84.88	79.50	87.00	71.08	71.25	83.14
Lognormal ($\mu = 0$, $\sigma = 1$)	0.14	0.03	6.82	6.82	6.77	4.67	7.54	11.31	17.69	17.61	3.01	12.46	9.21	14.58	14.44	2.45	9.58
		0.05	7.65	7.68	7.65	5.11	8.23	18.29	27.75	27.45	3.88	20.43	14.58	21.49	21.14	4.13	15.74
		0.1	8.94	9.92	9.64	6.08	9.69	36.85	49.98	48.42	8.50	41.03	27.51	37.86	36.21	8.36	30.43
		0.2	11.23	13.20	12.27	8.03	12.27	64.21	75.98	71.83	26.45	68.88	47.93	59.78	54.75	22.54	52.54
		0.3	12.66	15.74	13.93	10.07	14.28	78.43	87.08	80.99	48.97	82.32	60.38	71.32	62.63	39.07	65.20
		0.4	13.94	17.58	14.36	12.33	15.96	85.00	91.41	83.44	66.82	88.07	67.39	77.18	64.41	53.17	72.05
		0.5	14.21	18.23	13.68	14.05	16.43	87.33	92.77	81.59	77.38	90.03	69.14	78.65	61.10	61.73	73.75
Cauchy (median = 0, scale = 1)	0.38	0.03	5.99	6.99	7.05	1.04	6.62	12.33	15.85	15.62	5.27	12.70	14.82	20.52	20.21	4.25	14.62
		0.05	6.86	8.22	8.44	1.59	7.70	17.46	22.87	22.36	6.38	18.28	23.13	30.18	29.53	6.99	24.20
		0.1	4.56	5.54	7.89	3.23	5.25	30.04	38.77	37.04	10.79	32.37	40.92	50.98	49.00	13.29	43.81
		0.2	5.90	4.66	2.84	6.09	6.08	49.73	60.36	55.42	24.85	53.99	65.31	75.25	70.30	33.18	69.21
		0.3	7.11	5.77	2.37	8.51	7.60	61.61	71.95	63.59	40.66	66.43	77.57	85.47	78.21	53.33	81.21
		0.4	3.52	4.09	2.90	8.82	5.78	67.95	77.42	65.26	53.63	72.61	83.06	89.65	79.70	68.11	86.24
		0.5	2.58	3.72	4.29	4.17	3.46	69.96	79.30	62.08	61.97	74.67	84.97	90.92	76.72	76.64	87.78
Empirical SDMA distribution (mean = 0, SD = 1)	0.1	0.03	6.55	8.82	8.90	2.65	7.36	7.40	9.37	9.23	4.80	7.68	6.51	9.56	9.41	3.88	6.37
		0.05	8.25	10.88	10.83	3.37	9.23	9.54	12.34	11.97	5.38	10.04	9.65	12.70	12.35	5.40	10.02
		0.1	13.06	15.74	15.36	6.65	14.44	15.26	20.40	19.04	8.32	16.82	15.87	21.02	19.48	8.62	17.31
		0.2	19.27	24.31	22.41	11.59	21.69	27.39	35.34	30.36	17.50	30.80	28.20	36.27	31.04	18.36	31.61
		0.3	23.63	30.27	26.34	16.30	27.03	36.80	46.68	37.53	27.54	41.53	37.82	47.63	38.18	28.64	42.42
		0.4	26.73	34.38	27.59	21.41	30.67	43.01	53.43	40.89	35.72	48.19	44.10	54.50	41.56	36.61	49.10
		0.5	27.95	35.86	26.35	25.31	32.33	45.49	55.89	40.89	40.25	50.66	46.27	56.73	41.31	41.06	51.45

Note: Based on 100,000 simulations. Maximum standard error of estimates 0.16%. Bold face indicates the highest power across each row.

Abbreviations: KW – Kruskal-Wallis test