

**Table Sample Size Needed in Three-Group MANOVA for Power = .70, .80 and .90 for  $\alpha = .05$  and  $\alpha = .01$**

Power =			$\alpha = .05$			$\alpha = .01$		
			.70	.80	.90	.70	.80	.90
Effect Size	Number of Variables							
Very Large	$q^2 = 1.125$ $d = 1.5$ $c = 0.75$	2	11	13	16	15	17	21
		3	12	14	18	17	20	24
		4	14	16	19	19	22	26
		5	15	17	21	20	23	28
		6	16	18	22	22	25	29
		8	18	21	25	24	28	32
		10	20	23	27	27	30	35
		15	24	27	32	32	35	42
Large	$q^2 = 0.5$ $d = 1$ $c = 0.5$	2	21	26	33	31	36	44
		3	25	29	37	35	42	50
		4	27	33	42	38	44	54
		5	30	35	44	42	48	58
		6	32	38	48	44	52	62
		8	36	42	52	50	56	68
		10	39	46	56	54	62	74
		15	46	54	66	64	72	84
Moderate	$q^2 = 0.2813$ $d = 0.75$ $c = 0.375$	2	36	44	58	54	62	76
		3	42	52	64	60	70	86
		4	46	56	70	66	78	94
		5	50	60	76	72	82	100
		6	54	66	82	76	88	105
		8	60	72	90	84	98	120
		10	66	78	98	92	105	125
		15	78	92	115	110	125	145
Small	$q^2 = 0.125$ $d = 0.5$ $c = 0.25$	2	80	98	125	115	140	170
		3	92	115	145	135	155	190
		4	105	125	155	145	170	210
		5	110	135	170	155	185	220
		6	120	145	180	165	195	240
		8	135	160	200	185	220	260
		10	145	175	220	200	230	280
		15	170	210	250	240	270	320

**Table Sample Size Needed in Four-Group MANOVA for Power = .70, .80 and .90 for  $\alpha = .05$  and  $\alpha = .01$**

Power =			$\alpha = .05$			$\alpha = .01$		
			.70	.80	.90	.70	.80	.90
Effect Size	Number of Variables							
Very Large	$q^2 = 1.125$ $d = 1.5$ $c = 0.4743$	2	12	14	17	17	19	23
		3	14	16	20	19	22	26
		4	15	18	22	21	24	28
		5	16	19	23	23	26	30
		6	18	21	25	24	27	32
		8	20	23	28	27	30	36
		10	22	25	30	29	33	39
		15	26	30	36	35	39	46
Large	$q^2 = 0.5$ $d = 1$ $c = 0.3162$	2	24	29	37	34	40	50
		3	28	33	42	39	46	56
		4	31	37	46	44	50	60
		5	34	40	50	48	54	64
		6	36	44	54	50	58	70
		8	42	48	60	56	64	76
		10	46	52	64	62	70	82
		15	54	62	76	72	82	96
Moderate	$q^2 = 0.2813$ $d = 0.75$ $c = 0.2372$	2	42	50	64	60	70	86
		3	48	58	72	68	80	96
		4	54	64	80	76	88	105
		5	58	70	86	82	94	115
		6	62	74	92	86	100	120
		8	70	84	105	96	115	135
		10	78	92	115	105	120	145
		15	92	110	130	125	145	170
Small	$q^2 = 0.125$ $d = 0.5$ $c = 0.1581$	2	92	115	145	130	155	190
		3	105	130	165	150	175	220
		4	120	145	180	165	195	240
		5	130	155	195	180	210	250
		6	140	165	210	190	220	270
		8	155	185	230	220	250	300
		10	170	200	250	240	270	320
		15	200	240	290	280	320	370

**Table Sample Size Needed in Five-Group MANOVA for Power = .70, .80 and .90 for  $\alpha = .05$  and  $\alpha = .01$**

Power =			$\alpha = .05$			$\alpha = .01$		
			.70	.80	.90	.70	.80	.90
Effect Size	Number of Variables							
Very Large	$q^2 = 1.125$ $d = 1.5$ $c = 0.3354$	2	13	15	19	18	20	25
		3	15	17	21	20	23	28
		4	16	19	23	22	26	30
		5	18	21	25	24	28	33
		6	19	22	27	26	30	35
		8	22	25	30	29	33	39
		10	24	27	33	32	36	42
		15	28	33	39	38	44	50
Large	$q^2 = 0.5$ $d = 1$ $c = 0.2236$	2	26	32	40	37	44	54
		3	31	37	46	44	50	60
		4	34	42	50	48	56	66
		5	37	44	54	52	60	70
		6	40	48	58	56	64	76
		8	46	54	66	62	70	84
		10	50	58	72	68	78	90
		15	60	70	84	80	90	110
Moderate	$q^2 = 0.2813$ $d = 0.75$ $c = 0.1677$	2	46	56	70	66	76	92
		3	54	64	80	74	86	105
		4	60	72	88	82	96	115
		5	64	78	96	90	105	125
		6	70	82	105	96	110	135
		8	78	92	115	110	125	145
		10	86	105	125	120	135	160
		15	105	120	145	140	160	185
Small	$q^2 = 0.125$ $d = 0.5$ $c = 0.1118$	2	100	125	155	145	170	210
		3	120	145	180	165	195	240
		4	130	160	195	185	210	260
		5	145	170	220	200	230	280
		6	155	185	230	220	250	300
		8	175	210	260	240	280	330
		10	190	230	280	260	300	360
		15	230	270	330	310	350	420

**Table Sample Size Needed in Six-Group MANOVA for Power = .70, .80 and .90 for  $\alpha = .05$  and  $\alpha = .01$**

Power =			$\alpha = .05$			$\alpha = .01$		
			.70	.80	.90	.70	.80	.90
Effect Size	Number of Variables							
Very Large	$q^2 = 1.125$ $d = 1.5$ $c = 0.2535$	2	14	16	20	19	22	26
		3	16	18	23	22	25	29
		4	18	21	25	24	27	32
		5	19	22	27	26	30	35
		6	21	24	29	28	32	37
		8	23	27	33	31	35	42
		10	25	30	36	34	39	46
		15	30	35	42	42	46	54
Large	$q^2 = 0.5$ $d = 1$ $c = 0.1690$	2	28	34	44	40	46	56
		3	33	39	50	46	54	64
		4	37	44	54	52	60	70
		5	40	48	60	56	64	76
		6	44	52	64	60	68	82
		8	50	58	70	68	76	90
		10	54	64	78	74	84	98
		15	64	76	90	88	98	115
Moderate	$q^2 = 0.2813$ $d = 0.75$ $c = 0.1268$	2	50	60	76	70	82	98
		3	58	70	86	80	94	115
		4	64	76	96	90	105	125
		5	70	84	105	98	115	135
		6	76	90	110	105	120	145
		8	86	100	125	120	135	160
		10	94	110	135	130	145	175
		15	115	135	160	155	175	210
Small	$q^2 = 0.125$ $d = 0.5$ $c = 0.0845$	2	110	135	170	155	180	220
		3	130	155	190	180	210	250
		4	145	170	220	200	230	280
		5	155	185	230	220	250	300
		6	170	200	250	230	270	320
		8	190	230	280	260	300	350
		10	210	250	300	290	330	390
		15	250	290	360	340	380	460

จากตารางขนาดกลุ่มตัวอย่างในแต่ละกลุ่ม ให้พิจารณาอำนาจการทดสอบร่วมด้วย เช่น การทดสอบความแตกต่างระหว่าง 3 กลุ่มอำนาจการทดสอบ 0.8 ที่ระดับนัยสำคัญ .05 สำหรับขนาดอิทธิพลขนาดใหญ่ (large effect size) กับตัวแปร 4 ตัว จำนวนกลุ่มตัวอย่างอย่างน้อยที่สุดคือ 33 คนต่อกลุ่ม

ที่มา : Guilford, J. P. and Frunchter, Benjamin. **Fundamental Statistics in Psychology and Education.**

Singapore : McGraw-Hill Book Co., 1978.