

Supplement - Frequency of manipulative actions performed by GI and GII

Actions	High contrast cube		Bright cube		Tactile cube	
	Large	Small	Large	Small	Large	Small
Moving the cube away						
GI Minimum	0.0	0.0	0.0	0.0	0.0	0.0
GI Maximum	7.0	4.0	5.0	8.0	6.0	14.0
GI Average	1.3	0.7	1.1	1.4	0.9	2.1
p-value	0.213	0.68	0.111	0.101	0.121	0.068
GII Minimum	0.0	0.0	0.0	0.0	0.0	0.0
GII Maximum	1.0	0.0	1	1	1	0.0
GII Average	0.1	0.0	0.1	0.1	0.1	0.0
Shake cube						
GI Minimum	0.0	0.0	0.0	0.0	0.0	-
GI Maximum	15	52	2	18	28	-
GI Average	0.7	14.4	0.2	2.2	3.5	-
p-value	0.686	0.673	0.256	0.728	0.549	-
GII Minimum	0.0	0.0	0.0	0.0	0.0	-
GII Maximum	13.0	31.0	3.0	6.0	8.0	-
GII Average	3.4	7.8	0.7	1.1	2.0	-
Adjust the hub forward and backward						
GI Minimum	0.0	0.0	-	0.0	0.0	0.0
GI Maximum	26.0	15.0	-	14.0	18.0	12.0
GI Average	3.6	4.8	-	2.8	2.1	2.0
p-value	0.551	0.120	-	0.036	0.466	0.234
GII Minimum	0.0	0.0	-	0.0	0.0	0.0
GII Maximum	11.0	7.0	-	1.0	2.0	2.0
GII Average	2.0	0.9	-	0.1	0.2	0.2
Bimanual reach						
GI Minimum	0.0	-	0.0	0.0	3.0	0.0
GI Maximum	2.0	-	2.0	2.0	1.0	1.0
GI Average	1.1	-	0.9	0.4	0.0	0.2
p-value	0.111	-	0.624	0.829	0.350	1.000
GII Minimum	0.0	-	0.0	0.0	0.0	0.0
GII Maximum	1.0	-	4.0	1.0	1.0	1.0
GII Average	0.7	-	1.2	0.2	0.6	0.2
One-handed reach						
GI Minimum	0.0	1.0	0.0	0.0	0.0	0.0
GI Maximum	1.0	4.0	2.0	2.0	1.0	7.0
GI Average	0.4	1.6	0.6	1.0	0.5	1.7
p-value	0.861	0.829	0.313	0.584	1.0	0.427
GII Minimum	0.0	1.0	0.0	0.0	0.0	0.0
GII Maximum	2.0	6.0	1.0	1.0	1.0	1.0
GII Average	0.5	1.9	0.3	0.9	0.5	0.9

Note: GI = children with Trisomy 21 (n = 10); GII = typically developing children (n = 10). Values in bold indicate a significant difference in frequency.

Actions	High contrast cube		Bright cube		Tactile cube	
	Large	Small	Large	Small	Large	Small
Press cube						
GI Minimum	0.0	0.0	-	0.0	0.0	0.0
GI Maximum	20	0.0	-	0.0	0.0	0.0
GI Average	1.95	0.0	-	0.0	0.0	0.0
p-value	0.68	0.147	-	0.147	0.147	0.068
GII Minimum	0.0	0.0	-	0.0	0.0	0.0
GII Maximum	20.0	11.0	-	9.0	20.0	34.0
GII Average	3.9	1.3	-	1.0	3.0	4.9
Support the cube on one of its edges						
GI Minimum	0.0	0.0	0.0	0.0	0.0	-
GI Maximum	1.0	1.0	2.0	0.0	1.0	-
GI Average	0.1	0.1	0.3	0.0	0.1	-
p-value	0.255	0.503	0.054	0.147	0.234	-
GII Minimum	0.0	0.0	0.0	0.0	-	-
GII Maximum	2.0	42.0	11.0	5.0	-	-
GII Average	0.4	4.3	2.5	0.6	-	-
Bring the cube closer to the body						
GI Minimum	0.0	-	0.0	0.0	0.0	0.0
GI Maximum	2.0	-	1.0	2.0	4.0	4.0
GI Average	0.7	-	0.4	0.5	0.8	0.7
p-value	0.210	-	0.648	0.030	0.068	0.234
GII Minimum	0.0	-	0.0	0.0	0.0	0.0
GII Maximum	1.0	-	1.0	0.0	0.0	1.0
GII Average	0.1	-	0.3	0.0	0.0	0.1
Bring the cube closer to your eyes						
GI Minimum	0.0	-	0.0	0.0	-	-
GI Maximum	1.0	-	3.0	3.0	-	-
GI Average	0.3	-	0.9	1.6	-	-
p-value	0.276	-	0.108	0.003	-	-
GII Minimum	0.0	-	0.0	0.0	-	-
GII Maximum	1.0	-	1.0	2.0	-	-
GII Average	0.1	-	0.2	0.2	-	-
Bring your eyes closer to the cube						
GI Minimum	0.0	-	0.0	0.0	-	1.0
GI Maximum	4.0	-	11.0	4.0	-	0.3
GI Average	0.8	-	2.6	1.3	-	0.0
p-value	0.053	-	0.025	0.060	-	0.276
GII Minimum	0.0	-	0.0	0.0	-	0.0
GII Maximum	1.0	-	3.0	2.0	-	1.0
Hit with the cube						
GI Minimum	-	-	-	-	-	0.0
GI Maximum	-	-	-	-	-	0.0
GI Average	-	-	-	-	-	0.0
p-value	-	-	-	-	-	0.317
GII Minimum	-	-	-	-	-	0.0
GII Maximum	-	-	-	-	-	23
GII Average	-	-	-	-	-	2.3

Actions	High contrast cube		Bright cube		Tactile cube	
	Large	Small	Large	Small	Large	Small
Hit the cube						
GI Minimum	0.0	0.0	0.0	-	0.0	-
GI Maximum	0.5	0.5	2.6	-	2.5	-
GI Average	3.0	3.0	17.0	-	16.0	-
p-value	0.33	0.871	0.625	-	0.256	-
GII Minimum	3.0	0.0	0.0	-	0.0	-
GII Maximum	0.3	2.0	3.0	-	5.0	-
GII Average	0.3	0.3	0.8	-	0.5	-
Kick the cube						
GI Minimum	0.0	-	-	-	-	-
GI Maximum	7.0	-	-	-	-	-
GI Average	0.7	-	-	-	-	-
p-value	0.317	-	-	-	-	-
GII Minimum	0.0	-	-	-	-	-
GII Maximum	0.0	-	-	-	-	-
GII Average	0.0	-	-	-	-	-
Slide hands/fingers						
GI Minimum	0.0	0.0	0.0	0.0	0.0	0.0
GI Maximum	6.0	1.0	12.0	5.0	6.0	21.0
GI Average	0.6	0.1	2.2	0.7	2.5	3.3
p-value	0.012	0.360	0.516	0.039	0.045	0.353
GII Minimum	0.0	0.0	0.0	0.0	0.0	0.0
GII Maximum	16.0	32.0	18.0	7.0	30.0	28.0
GII Average	4.8	4.7	5.2	3.0	12.9	10.6
Slide cube to the ground						
GI Minimum	0.0	0.0	0.0	0.0	0.0	-
GI Maximum	7.0	2.0	5.0	8.0	4.0	-
GI Average	1.0	0.5	1.8	1.7	0.9	-
p-value	0.486	0.068	0.246	0.079	0.196	-
GII Minimum	0.0	0.0	0.0	0.0	0.0	-
GII Maximum	1.0	0.0	2.0	3.0	3.0	-
GII Average	0.2	0.0	7.0	0.4	0.4	-
Rotate cube						
GI Minimum	0.0	0.0	-	0.0	0.0	0.0
GI Maximum	8.0	20.0	-	13.0	9.0	26.0
GI Average	2.8	4.1	-	5.1	3.6	4.3
p-value	0.000	0.007	0.017	0.002	0.002	0.018
GII Minimum	6.0	1.0	0.0	3.0	4.0	2.0
GII Maximum	32.0	40.0	34.0	28.0	39.0	24.0
GII Average	16.5	16.9	15.6	15.5	15.4	11.7
Throw cube diagonally						
GI Minimum	-	0.0	-	0.0	-	-
GI Maximum	-	2.0	-	6.0	-	-
GI Average	-	0.3	-	0.7	-	-
p-value	-	0.584	-	0.147	-	-

Actions	High contrast cube		Bright cube		Tactile cube	
	Large	Small	Large	Small	Large	Small
Throw cube diagonally						
GI Minimum	0.0	0.0	-	0.0	-	-
GI Maximum	0.0	2.0	-	0.0	-	-
GI Average	0.0	0.2	-	0.0	-	-
Throw the cube upwards						
GI Minimum	0.0	0.0	0.0	0.0	0.0	0.0
GI Maximum	33.0	22.0	0.0	0.0	37.0	40.0
GI Average	4.5	5.3	0.0	0.0	4.6	5.8
p-value	0.859	0.305	0.317	0.317	0.213	0.466
GII Minimum	0.0	0.0	0.0	0.0	0.0	0.0
GII Maximum	39.0	15.0	33.0	17.0	55.0	10.0
GII Average	5.5	1.7	3.3	1.7	5.6	1.0
Throw cube forward						
GI Minimum	0.0	0.0	-	0.0	0.0	0.0
GI Maximum	1.0	1.0	-	3.0	1.0	4.0
GI Average	0.4	0.3	-	0.4	0.3	0.7
p-value	0.290	0.842	-	0.627	0.067	0.178
GII Minimum	0.0	0.0	-	0.0	0.0	0.0
GII Maximum	0.0	15.0	-	16.0	0.0	4.0
GII Average	0.0	1.7	-	1.6	0.0	0.4
Roll the cube						
GI Minimum	0.0	0.0	0.0	0.0	0.0	0.0
GI Maximum	34.0	12.0	4.0	5.0	5.0	14.0
GI Average	4.5	2.5	1.1	1.2	1.8	2.0
p-value	0.578	0.224	0.210	0.521	0.288	0.121
GII Minimum	0.0	0.0	0.0	0.0	0.0	0.0
GII Maximum	5.0	4.0	16.0	8.0	20.0	17.0
GII Average	1.3	0.8	1.8	1.4	2.6	1.8
Hold the cube with only one hand						
GI Minimum	0.0	0.0	-	0.0	0.0	0.0
GI Maximum	1.0	4.0	-	7.0	3.0	3.0
GI Average	0.1	1.8	-	1.8	0.5	1.3
p-value	0.503	0.378	-	0.051	0.33	0.148
GII Minimum	0.0	0.0	-	0.0	0.0	0.0
GII Maximum	2.0	7.0	-	4.0	3.0	2.0
GII Average	0.3	1.6	-	0.7	0.33	0.6
Transfer the cube from one hand to the other						
GI Minimum	0.0	0.0	0.0	0.0	0.0	0.1
GI Maximum	-	4.0	0.0	6.0	0.0	0.1
GI Average	-	0.8	0.0	0.7	0.0	0.0
p-value	-	0.691	0.147	0.957	0.147	0.247
GII Minimum	0.0	0.0	0.0	0.0	0.0	0.0
GII Maximum	1.0	30.0	8.0	28.0	7.0	46.0
GII Average	0.7	3.2	1.2	2.9	0.9	7.3