

Data Analytics CA Pair Project - VR Jungian Sandplay

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Abstract

Aim and Rationale

The aim and rationale of this project is to formulate a single hypothesis based on a set of data we were given on an experiment conducted to attempt to determine the effectiveness of use of VR technology in Jungian Sandbox therapy, compare the effectiveness of the approaches based on the data we were provided, and cleaning up any data that requires cleanup.

Participants and setting

Participants of this experiment were young adults aged between 18 - 25 years old with no exact ages of the participants recorded. 150 participants were recorded in this study with an equal amount of male and female participants recorded. (Male = 75 / Female = 75) Participants were broken into 3 groups using random sampling. These groups were Control (traditional CBT, w/ No VR), Static (Non-animated model content, w/ VR), Animated (Animated model content, w/ VR)

Experiment design

Results gathering

Results of the experiment were tracked in an excel spreadsheet detailing the gender and test group of each participant (Control, Static, Animated) along with their CPSS (Child PTSD Symptom Scale) and OR (Observer Rating) pre and post treatment.

Major findings

Findings/Implications

Introduction

Topics And content

Rationale

The Rationale behind this experiment was to determine if using VR technology in a Jungian Sandbox setting could be beneficial in reducing the PTSD levels in patients. ## Hypothesis

Method

Participants

Participants of this experiment were young adults aged between 18 - 25 years old with no exact ages of the participants recorded. 150 participants were recorded in this study with an equal amount of male and female participants recorded. (Male = 75 / Female = 75) Participants were broken into 3 groups using random sampling. These groups were Control (traditional CBT, w/ No VR), Static (Non-animated model content, w/ VR), Animated (Animated model content, w/ VR)

Design

Materials

Procedure

Results

Table 1: Patient Data

X	gender	test_group	pre_trial_cpss	post_trial_cpss	pre_trial_or	post_trial_or
1	Male	Static	4.54	5.77	4.48	5.95
2	Male	Static	6.36	5.29	6.08	5.24
3	Male	Static	5.17	6.86	5.08	6.90
4	Male	Static	4.56	5.59	4.09	5.36
5	Male	Static	3.84	5.43	4.33	5.26
6	Male	Static	7.09	6.92	7.58	6.69
7	Male	Static	4.91	5.46	4.89	5.50
8	Male	Static	7.24	5.65	7.37	5.72
9	Male	Static	6.24	7.54	6.46	7.73
10	Male	Static	8.52	5.51	8.51	5.70
11	Male	Static	5.83	6.10	6.16	6.31
12	Male	Static	7.78	5.18	7.28	5.00
13	Male	Static	5.76	5.11	5.35	5.10
14	Male	Static	6.29	6.19	6.82	6.37
15	Male	Static	7.31	5.18	7.16	5.17
16	Male	Static	6.61	4.19	6.54	4.15
17	Male	Static	5.73	4.43	5.75	4.37
18	Male	Static	6.93	6.46	6.79	6.45
19	Male	Static	7.41	7.91	7.46	7.68
20	Male	Static	7.00	6.13	7.49	6.35
21	Male	Static	7.88	5.47	7.90	5.32
22	Male	Static	6.25	4.97	6.00	5.18
23	Male	Static	5.88	5.12	6.04	4.93
24	Male	Static	5.79	7.24	6.30	7.18
25	Male	Static	7.56	6.47	7.60	6.64
26	Female	Static	6.28	5.72	5.98	5.95
27	Female	Static	5.50	4.65	5.50	4.50
28	Female	Static	5.81	5.07	6.07	5.17
29	Female	Static	5.06	4.03	4.53	3.96
30	Female	Static	6.17	5.58	6.54	5.69
31	Female	Static	6.06	5.41	5.87	5.58
32	Female	Static	6.56	6.11	6.96	6.30
33	Female	Static	5.82	5.09	5.82	4.86
34	Female	Static	6.24	5.67	6.44	5.75
35	Female	Static	5.79	5.05	5.74	5.01
36	Female	Static	5.50	4.65	5.30	4.58
37	Female	Static	5.66	4.87	5.59	5.01
38	Female	Static	4.49	3.24	4.09	3.03
39	Female	Static	6.04	5.39	6.41	5.24
40	Female	Static	6.90	6.59	6.58	6.37
41	Female	Static	6.04	5.39	5.93	5.26

X	gender	test_group	pre_trial_cpss	post_trial_cpss	pre_trial_or	post_trial_or
42	Female	Static	5.28	4.34	5.57	4.30
43	Female	Static	6.09	5.46	5.79	5.49
44	Female	Static	4.10	2.70	4.26	2.50
45	Female	Static	6.19	5.61	6.38	5.67
46	Female	Static	6.92	6.61	7.03	6.70
47	Female	Static	5.37	4.47	5.05	4.28
48	Female	Static	6.13	5.52	5.78	5.35
49	Female	Static	4.86	3.76	4.86	3.94
50	Female	Static	5.74	4.97	5.83	4.95
51	Male	Control	5.60	6.53	5.62	6.66
52	Male	Control	4.37	4.86	4.59	4.88
53	Male	Control	6.86	6.24	6.96	6.27
54	Male	Control	4.97	5.52	4.95	5.75
55	Male	Control	7.40	5.21	7.06	5.45
56	Male	Control	6.66	6.87	7.18	7.08
57	Male	Control	6.17	5.10	6.17	5.13
58	Male	Control	7.24	5.82	7.46	5.61
59	Male	Control	8.00	5.61	8.34	5.49
60	Male	Control	6.30	6.20	6.42	6.25
61	Male	Control	7.23	4.41	6.89	4.46
62	Male	Control	5.73	3.62	5.25	3.69
63	Male	Control	7.90	6.32	7.88	6.23
64	Male	Control	4.93	5.98	5.09	6.14
65	Male	Control	5.09	4.42	4.97	4.59
66	Male	Control	4.03	5.19	4.02	5.02
67	Male	Control	5.37	6.05	5.21	6.12
68	Male	Control	7.85	4.87	7.70	4.80
69	Male	Control	6.65	5.76	7.11	5.69
70	Male	Control	5.56	5.93	6.07	5.71
71	Male	Control	6.83	7.04	7.29	7.25
72	Male	Control	6.21	4.75	6.44	4.58
73	Male	Control	5.75	6.19	6.07	6.17
74	Male	Control	6.06	6.64	5.76	6.67
75	Male	Control	6.75	5.23	7.25	5.35
76	Female	Control	5.14	4.14	5.28	4.04
77	Female	Control	6.45	5.96	6.11	5.95
78	Female	Control	5.03	3.99	5.24	3.90
79	Female	Control	6.33	5.80	6.03	5.68
80	Female	Control	4.66	3.48	5.04	3.51
81	Female	Control	6.20	5.61	6.30	5.57
82	Female	Control	5.68	4.90	5.24	5.01
83	Female	Control	5.02	3.98	5.12	3.94
84	Female	Control	5.74	4.98	5.33	5.20
85	Female	Control	7.27	7.10	7.79	7.16
86	Female	Control	6.73	6.35	6.67	6.35
87	Female	Control	5.57	4.73	5.25	4.94
88	Female	Control	6.49	6.01	6.48	5.82
89	Female	Control	5.50	4.65	6.05	4.45
90	Female	Control	7.10	6.86	7.02	6.88
91	Female	Control	6.16	5.56	6.47	5.65
92	Female	Control	5.17	4.19	4.86	4.05
93	Female	Control	5.89	5.19	6.16	5.02

X	gender	test_group	pre_trial_cpss	post_trial_cpss	pre_trial_or	post_trial_or
94	Female	Control	6.47	5.99	6.46	5.87
95	Female	Control	2.49	0.48	2.97	0.25
96	Female	Control	4.18	2.82	4.04	2.71
97	Female	Control	5.30	4.36	5.53	4.16
98	Female	Control	7.64	7.61	7.50	7.54
99	Female	Control	5.93	5.24	6.30	5.11
100	Female	Control	NA	6.17	7.00	6.30
101	Male	Animated	7.34	4.99	6.85	4.83
102	Male	Animated	6.32	6.18	6.48	6.35
103	Male	Animated	7.62	5.49	7.82	5.27
104	Male	Animated	5.11	6.36	4.75	6.14
105	Male	Animated	7.29	4.64	7.71	4.86
106	Male	Animated	6.42	4.28	6.79	4.34
107	Male	Animated	6.50	4.29	7.03	4.08
108	Male	Animated	5.29	3.56	5.56	3.46
109	Male	Animated	6.42	6.05	6.84	6.05
110	Male	Animated	5.52	6.38	5.13	6.19
111	Male	Animated	5.59	5.11	5.83	5.35
112	Male	Animated	7.21	3.79	6.90	3.72
113	Male	Animated	5.61	6.79	5.73	6.83
114	Male	Animated	4.63	6.61	4.23	6.73
115	Male	Animated	5.87	6.56	5.60	6.57
116	Male	Animated	4.28	4.87	4.44	4.93
117	Male	Animated	6.10	4.88	5.94	4.98
118	Male	Animated	4.65	4.56	4.99	4.45
119	Male	Animated	8.63	6.13	8.74	5.99
120	Mal	Animated	7.18	6.45	7.22	6.69
121	Male	Animated	7.21	5.49	7.78	5.66
122	Male	Animated	7.83	3.90	8.37	3.65
123	Male	Animated	6.84	6.96	6.33	6.79
124	Male	Animated	5.77	5.82	6.02	5.90
125	Male	Animated	7.41	5.08	7.25	5.17
126	Female	Animated	5.40	4.50	4.99	4.49
127	Female	Animated	5.83	5.10	6.40	5.11
128	Female	Animated	5.87	5.15	5.87	5.22
129	Female	Animated	4.22	2.87	3.98	2.88
130	Female	Animated	5.74	4.98	5.45	5.21
131	Female	Animated	6.24	5.67	5.67	5.82
132	Female	Animated	6.63	6.21	6.33	6.43
133	Female	Animated	5.38	4.48	5.71	4.69
134	Female	Animated	5.96	5.29	6.23	5.34
135	Female	Animated	6.59	6.16	6.35	6.23
136	Female	Animated	6.34	5.80	6.83	5.72
137	Female	Animated	6.57	6.12	6.38	5.89
138	Female	Animated	7.33	7.17	6.81	7.01
139	Female	Animated	4.05	2.64	3.93	2.86
140	Female	Animated	7.22	7.02	7.20	6.80
141	Female	Animated	5.13	4.13	5.51	3.88
142	Female	Animated	5.22	4.26	5.41	4.24
143	Female	Animated	5.10	4.09	5.45	4.08
144	Female	Animated	6.40	5.90	6.62	5.69
145	Female	Animatd	6.51	6.05	7.05	5.89

X	gender	test_group	pre_trial_cpss	post_trial_cpss	pre_trial_or	post_trial_or
146	Female	Animated	6.20	5.62	6.66	5.61
147	Female	Animated	5.98	5.31	6.26	5.23
148	Female	Animated	6.31	5.77	6.37	5.73
149	Female	Animated	5.61	4.80	5.95	4.91
150	Female	Animated	6.25	5.69	6.06	5.83

Table 2: Patient Data (NO NA)

	X	gender	test_group	pre_trial_cpss	post_trial_cpss	pre_trial_or	post_trial_or
1	1	Male	Static	4.54	5.77	4.48	5.95
2	2	Male	Static	6.36	5.29	6.08	5.24
3	3	Male	Static	5.17	6.86	5.08	6.90
4	4	Male	Static	4.56	5.59	4.09	5.36
5	5	Male	Static	3.84	5.43	4.33	5.26
6	6	Male	Static	7.09	6.92	7.58	6.69
7	7	Male	Static	4.91	5.46	4.89	5.50
8	8	Male	Static	7.24	5.65	7.37	5.72
9	9	Male	Static	6.24	7.54	6.46	7.73
10	10	Male	Static	8.52	5.51	8.51	5.70
11	11	Male	Static	5.83	6.10	6.16	6.31
12	12	Male	Static	7.78	5.18	7.28	5.00
13	13	Male	Static	5.76	5.11	5.35	5.10
14	14	Male	Static	6.29	6.19	6.82	6.37
15	15	Male	Static	7.31	5.18	7.16	5.17
16	16	Male	Static	6.61	4.19	6.54	4.15
17	17	Male	Static	5.73	4.43	5.75	4.37
18	18	Male	Static	6.93	6.46	6.79	6.45
19	19	Male	Static	7.41	7.91	7.46	7.68
20	20	Male	Static	7.00	6.13	7.49	6.35
21	21	Male	Static	7.88	5.47	7.90	5.32
22	22	Male	Static	6.25	4.97	6.00	5.18
23	23	Male	Static	5.88	5.12	6.04	4.93
24	24	Male	Static	5.79	7.24	6.30	7.18
25	25	Male	Static	7.56	6.47	7.60	6.64
26	26	Female	Static	6.28	5.72	5.98	5.95
27	27	Female	Static	5.50	4.65	5.50	4.50
28	28	Female	Static	5.81	5.07	6.07	5.17
29	29	Female	Static	5.06	4.03	4.53	3.96
30	30	Female	Static	6.17	5.58	6.54	5.69
31	31	Female	Static	6.06	5.41	5.87	5.58
32	32	Female	Static	6.56	6.11	6.96	6.30
33	33	Female	Static	5.82	5.09	5.82	4.86
34	34	Female	Static	6.24	5.67	6.44	5.75
35	35	Female	Static	5.79	5.05	5.74	5.01
36	36	Female	Static	5.50	4.65	5.30	4.58
37	37	Female	Static	5.66	4.87	5.59	5.01
38	38	Female	Static	4.49	3.24	4.09	3.03
39	39	Female	Static	6.04	5.39	6.41	5.24
40	40	Female	Static	6.90	6.59	6.58	6.37
41	41	Female	Static	6.04	5.39	5.93	5.26

	X	gender	test_group	pre_trial_cpss	post_trial_cpss	pre_trial_or	post_trial_or
42	42	Female	Static	5.28	4.34	5.57	4.30
43	43	Female	Static	6.09	5.46	5.79	5.49
44	44	Female	Static	4.10	2.70	4.26	2.50
45	45	Female	Static	6.19	5.61	6.38	5.67
46	46	Female	Static	6.92	6.61	7.03	6.70
47	47	Female	Static	5.37	4.47	5.05	4.28
48	48	Female	Static	6.13	5.52	5.78	5.35
49	49	Female	Static	4.86	3.76	4.86	3.94
50	50	Female	Static	5.74	4.97	5.83	4.95
51	51	Male	Control	5.60	6.53	5.62	6.66
52	52	Male	Control	4.37	4.86	4.59	4.88
53	53	Male	Control	6.86	6.24	6.96	6.27
54	54	Male	Control	4.97	5.52	4.95	5.75
55	55	Male	Control	7.40	5.21	7.06	5.45
56	56	Male	Control	6.66	6.87	7.18	7.08
57	57	Male	Control	6.17	5.10	6.17	5.13
58	58	Male	Control	7.24	5.82	7.46	5.61
59	59	Male	Control	8.00	5.61	8.34	5.49
60	60	Male	Control	6.30	6.20	6.42	6.25
61	61	Male	Control	7.23	4.41	6.89	4.46
62	62	Male	Control	5.73	3.62	5.25	3.69
63	63	Male	Control	7.90	6.32	7.88	6.23
64	64	Male	Control	4.93	5.98	5.09	6.14
65	65	Male	Control	5.09	4.42	4.97	4.59
66	66	Male	Control	4.03	5.19	4.02	5.02
67	67	Male	Control	5.37	6.05	5.21	6.12
68	68	Male	Control	7.85	4.87	7.70	4.80
69	69	Male	Control	6.65	5.76	7.11	5.69
70	70	Male	Control	5.56	5.93	6.07	5.71
71	71	Male	Control	6.83	7.04	7.29	7.25
72	72	Male	Control	6.21	4.75	6.44	4.58
73	73	Male	Control	5.75	6.19	6.07	6.17
74	74	Male	Control	6.06	6.64	5.76	6.67
75	75	Male	Control	6.75	5.23	7.25	5.35
76	76	Female	Control	5.14	4.14	5.28	4.04
77	77	Female	Control	6.45	5.96	6.11	5.95
78	78	Female	Control	5.03	3.99	5.24	3.90
79	79	Female	Control	6.33	5.80	6.03	5.68
80	80	Female	Control	4.66	3.48	5.04	3.51
81	81	Female	Control	6.20	5.61	6.30	5.57
82	82	Female	Control	5.68	4.90	5.24	5.01
83	83	Female	Control	5.02	3.98	5.12	3.94
84	84	Female	Control	5.74	4.98	5.33	5.20
85	85	Female	Control	7.27	7.10	7.79	7.16
86	86	Female	Control	6.73	6.35	6.67	6.35
87	87	Female	Control	5.57	4.73	5.25	4.94
88	88	Female	Control	6.49	6.01	6.48	5.82
89	89	Female	Control	5.50	4.65	6.05	4.45
90	90	Female	Control	7.10	6.86	7.02	6.88
91	91	Female	Control	6.16	5.56	6.47	5.65
92	92	Female	Control	5.17	4.19	4.86	4.05
93	93	Female	Control	5.89	5.19	6.16	5.02

	X	gender	test_group	pre_trial_cpss	post_trial_cpss	pre_trial_or	post_trial_or
94	94	Female	Control	6.47	5.99	6.46	5.87
95	95	Female	Control	2.49	0.48	2.97	0.25
96	96	Female	Control	4.18	2.82	4.04	2.71
97	97	Female	Control	5.30	4.36	5.53	4.16
98	98	Female	Control	7.64	7.61	7.50	7.54
99	99	Female	Control	5.93	5.24	6.30	5.11
101	101	Male	Animated	7.34	4.99	6.85	4.83
102	102	Male	Animated	6.32	6.18	6.48	6.35
103	103	Male	Animated	7.62	5.49	7.82	5.27
104	104	Male	Animated	5.11	6.36	4.75	6.14
105	105	Male	Animated	7.29	4.64	7.71	4.86
106	106	Male	Animated	6.42	4.28	6.79	4.34
107	107	Male	Animated	6.50	4.29	7.03	4.08
108	108	Male	Animated	5.29	3.56	5.56	3.46
109	109	Male	Animated	6.42	6.05	6.84	6.05
110	110	Male	Animated	5.52	6.38	5.13	6.19
111	111	Male	Animated	5.59	5.11	5.83	5.35
112	112	Male	Animated	7.21	3.79	6.90	3.72
113	113	Male	Animated	5.61	6.79	5.73	6.83
114	114	Male	Animated	4.63	6.61	4.23	6.73
115	115	Male	Animated	5.87	6.56	5.60	6.57
116	116	Male	Animated	4.28	4.87	4.44	4.93
117	117	Male	Animated	6.10	4.88	5.94	4.98
118	118	Male	Animated	4.65	4.56	4.99	4.45
119	119	Male	Animated	8.63	6.13	8.74	5.99
120	120	Mal	Animated	7.18	6.45	7.22	6.69
121	121	Male	Animated	7.21	5.49	7.78	5.66
122	122	Male	Animated	7.83	3.90	8.37	3.65
123	123	Male	Animated	6.84	6.96	6.33	6.79
124	124	Male	Animated	5.77	5.82	6.02	5.90
125	125	Male	Animated	7.41	5.08	7.25	5.17
126	126	Female	Animated	5.40	4.50	4.99	4.49
127	127	Female	Animated	5.83	5.10	6.40	5.11
128	128	Female	Animated	5.87	5.15	5.87	5.22
129	129	Female	Animated	4.22	2.87	3.98	2.88
130	130	Female	Animated	5.74	4.98	5.45	5.21
131	131	Female	Animated	6.24	5.67	5.67	5.82
132	132	Female	Animated	6.63	6.21	6.33	6.43
133	133	Female	Animated	5.38	4.48	5.71	4.69
134	134	Female	Animated	5.96	5.29	6.23	5.34
135	135	Female	Animated	6.59	6.16	6.35	6.23
136	136	Female	Animated	6.34	5.80	6.83	5.72
137	137	Female	Animated	6.57	6.12	6.38	5.89
138	138	Female	Animated	7.33	7.17	6.81	7.01
139	139	Female	Animated	4.05	2.64	3.93	2.86
140	140	Female	Animated	7.22	7.02	7.20	6.80
141	141	Female	Animated	5.13	4.13	5.51	3.88
142	142	Female	Animated	5.22	4.26	5.41	4.24
143	143	Female	Animated	5.10	4.09	5.45	4.08
144	144	Female	Animated	6.40	5.90	6.62	5.69
145	145	Female	Animatd	6.51	6.05	7.05	5.89
146	146	Female	Animated	6.20	5.62	6.66	5.61

	X	gender	test_group	pre_trial_cpss	post_trial_cpss	pre_trial_or	post_trial_or
147	147	Female	Animated	5.98	5.31	6.26	5.23
148	148	Female	Animated	6.31	5.77	6.37	5.73
149	149	Female	Animated	5.61	4.80	5.95	4.91
150	150	Female	Animated	6.25	5.69	6.06	5.83

Pre trial cpss mean = 6.0634228

Post trial cpss mean = 5.3642

Pre trial or mean = 6.1146667

Post trial or mean = 5.3570667

Pre trial cpss standard deviation = 1.0168896

Post trial cpss standard deviation = 1.0966577

Pre trial or standard deviation = 1.0606125

Post trial or standard deviation = 1.1234167

```
##          X          gender      test_group      pre_trial_cpss
##  Min.   : 1.00   Length:150   Length:150   Min.   :2.490
##  1st Qu.: 38.25   Class :character Class :character 1st Qu.:5.500
##  Median : 75.50   Mode  :character   Mode  :character Median :6.090
##  Mean   : 75.50                                     Mean   :6.063
##  3rd Qu.:112.75                                     3rd Qu.:6.660
##  Max.   :150.00                                     Max.   :8.630
##                                                    NA's    :1
## post_trial_cpss pre_trial_or post_trial_or
##  Min.   :0.480   Min.   :2.970   Min.   :0.250
##  1st Qu.:4.763   1st Qu.:5.420   1st Qu.:4.838
##  Median :5.460   Median :6.095   Median :5.355
##  Mean   :5.364   Mean   :6.115   Mean   :5.357
##  3rd Qu.:6.117   3rd Qu.:6.848   3rd Qu.:6.140
##  Max.   :7.910   Max.   :8.740   Max.   :7.730
##
```

Descriptive statistics

Inferential statistics

Statistical tests

Magnitude and direction of results

Discussion

References

Help with getting mean of data while data is missing from column *Stack Overflow

Removing Na's by Column *GeekforGeeks