CHAPTER -6

6.0. RESULTS

6.1 STUDY ONE

Psychological assessments were conducted on 65 systems in the central computer lab. All raw data from the server computer were collected after completing the tests. Data were extracted to excel sheet. The Implicit Associate Test data were scored and extracted using standard algorithms (Greenwald et al., 2003). In addition, all variables' data were consolidated into a single excel file, and duplicate data were deleted. Then, for the variables that required reverse scores, reverse scores were applied, and descriptive statistics were generated for all variables. For each variable, the internal consistency metric Cronbach's alpha was calculated. We performed first-order Pearson's correlation, keeping social desirability as the controlling variable. The statistical computer software R 4.1.0 was used to analyse the data (R Core Team, 2021). The raw data and the R analysis script associated with this study can be obtained from this Open Science Framework link: https://osf.io/5rpk3/?view_only=c96fdf6eb757477abfe96ea84eaf0405

The following variables were measured under various domains: Demographic profile, social desirability, General health, Single Target Engineering Implicit Association Test (E-IAT) for implicit engineering choice, Explicit measure of engineering choice, Perceived competency for learning, Self-esteem, the parental Scale, which contains six sub-domains (Offering choices, Explaining reasons, Being aware, Threatening to punish, Inducing guilt, Encouraging performance), the Adult Attachment Scale, which has three sub-domains-Close, Dependent and Anxiety, and the Reason for Learning (Autonomous regulation and

Controlled regulation). As a part of the academic curriculum, physical assessments were also done, however, they are not reported in this study.

6.1.1. DESCRIPTIVE STATISTICS

Figure 6.1

Study Design of Study 1

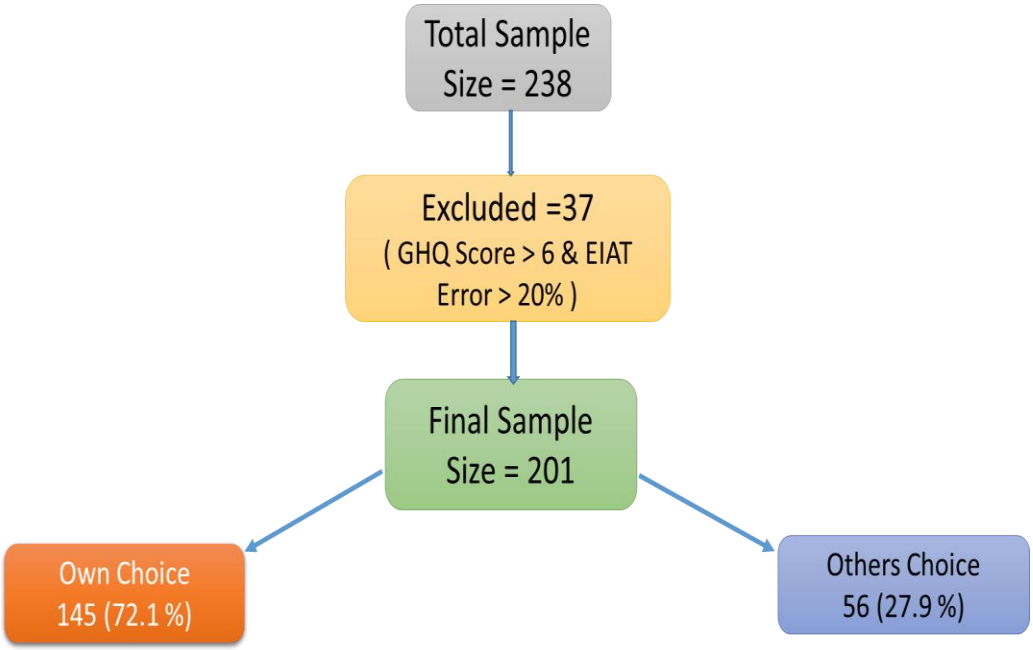


Table 6.1 displays the means and standard deviations of psychological variables. The study's overall sample size was 238 participants, but we had to eliminate 37 of them.Those students with severe distress were removed (GHQ score greater than 6). Further, high error in the implicit measure (greater than 20%) were also removed. This led to a final analysable sample size of 201.

Table 6.1

Descriptive Statistics *(n=201)*

Variables	Mean	SD
Attachment type - Close	3.51	0.65
Attachment type - Dependent	3.01	0.66
Attachment type - Anxiety	2.96	0.86
Perceived competency for Learning	5.71	1.07
Implicit engineering attitude	0.02	0.24
Explicit engineering attitude	22.28	5.27
Self esteem	28.21	3.07
General Health	2.21	1.82
Social Desirability	6.81	2.24
Parenting style - Offering choices	4.83	1.34
Parenting style - Explaining reasons	4.59	1.24
Parenting style - Being aware	4.67	1.41
Parenting style - Threatening to punish	2.91	1.41
Parenting style - Inducing guilt	2.71	1.34
Parenting style - Encouraging performance	4.57	1.23
Reason for learning - Autonomous	5.36	0.96
Reason for learning - Controlled	4.20	1.05

There were 145 out of 201 (72.1%) who had chosen to engineer out of their own choice, and 56 (27.9%) who had chosen their engineering program influenced through others (parents, friends, teachers). There were 80 (39.8%) yoga practitioners, and 121 (60.2%) non yoga practitioners.

6.1.2. IMPLICIT ATTITUDE TOWARDS ENGINEERING

We used Engineering Implicit Association Test (E-IAT) to assess implicit preference towards engineering. The tool was constructed in such a way that positive score means higher implicit preference towards engineering, and negative score means lower implicit preference towards engineering. The explicit self-report measure of engineering attitude was measured using feeling thermometer. Apart from that, another question in the demographic profile was asked about their source of influence of choice to take up engineering–own choice or other's choice (parents, family, teachers). Keeping the positive and negative scores on E-IAT and explicit expression of engineering choice, we formed the following table depicting the interaction with implicit and explicit measures of engineering choices.

Table 6.2

Implicit-Explicit Attitude Towards Engineering

(n=201)	Explicit Choice: Own	Explicit Choice: Other's
Implicit Choice: Positive	78	33
Implicit Choice: Negative	67	23

In the table 6.2, we have shown sensitivity, specificity, predictive positive rate, and predictive negative rate (Trevethan, 2017). Here, we consider the explicit self-report of their choice of joining engineering (own choice or other's choice) as the reference, and the

implicit attitude towards engineering (positive and negative implicit attitude) as the test tool. Sensitivity is showing positive score in E-IAT when the explicit choice is expressed as own choice, and here it was 53.79%. Specificity was 41.07%, that is when the explicit choice was other's choice and the implicit choice was negative. The positive predictive value was 70.27%, that is when the implicit measured showed positive implicit attitude towards engineering the explicit choice also showed own choice. Finally, negative predictive value was 25.56%, that is when the implicit measure showed negative, and the explicit preference was other's choice. We got more number in own choice and positive E-IAT category compared to other's choice and negative E-IAT scores. This is because the E-IAT was designed to be a single target implicit association test, and hence the opposite target was absent and therefore the specificity was expected to be lower. Also, the validity of these metrices is limited to the validity of the self-report measure and the implicit tool used. Or in other words, limitations in the reference or the testing tool can influence the four metrices. The overall correlation between implicit and explicit measures was observed as expected. The correlation between positive E-IAT scores and explicit self-report measure using feeling thermometer showed positive correlation (0.22). Similarly, the correlation between negative E-IAT scores and explicit self-report measure showed negative correlation (-0.24). This further strengthens the inference derived from E-IAT.

6.1.3. CORRELATION ACROSS POSITIVE AND NEGATIVE IMPLICIT ATTITUDE GROUPS

Table 6.3

Correlation Across Positive and Negative Implicit Attitude Groups

Variable Pairs	Positive (n = 111)		Negative (n = 90)	
	r value	P value	r value	P value
Self esteem and attachment style				
Self esteem - Close	0.31	0.001	0.09	0.411
Self esteem - Dependent	0.02	0.798	0.11	0.306
Self esteem - Anxiety	-0.10	0.293	-0.14	0.200
Self esteem and parental scale				
Self esteem - Being aware	0.21	0.026	0.04	0.679
Self esteem - Encouraging Performance	0.14	0.136	0.11	0.305
Self esteem - Explaining reasons	0.06	0.525	-0.03	0.779
Self esteem - Inducing guilt	-0.24	0.012	-0.21	0.047
Self esteem - Offering choices	0.20	0.037	0.00	0.969
Self esteem - Threatening to punish	-0.19	0.053	-0.07	0.490
Attachment style and parental scale				
Close - Being aware	0.06	0.531	0.06	0.606
Close - Encouraging Performance	0.08	0.431	0.13	0.242
Close - Explaining reasons	-0.08	0.399	0.11	0.284
Close - Offering choices	-0.09	0.371	-0.04	0.709
Close - Inducing guilt	0.08	0.390	0.16	0.147
Close - Threatening to punish	-0.15	0.114	-0.17	0.121

Dependent - Being aware	-0.03	0.749	0.00	0.975
Dependent - Encouraging Performance	-0.13	0.179	-0.04	0.690
Dependent - Explaining reasons	-0.12	0.194	-0.06	0.592
Dependent - Offering choices	0.06	0.524	-0.06	0.574
Dependent - Inducing guilt	-0.09	0.361	0.03	0.813
Dependent - Threatening to punish	0.01	0.903	0.01	0.954
Anxiety - Being aware	0.06	0.521	0.13	0.234
Anxiety - Encouraging Performance	0.15	0.130	0.09	0.383
Anxiety - Explaining reasons	-0.08	0.380	0.20	0.061
Anxiety - Offering choices	0.03	0.768	0.24	0.021
Anxiety - Inducing guilt	0.07	0.441	0.14	0.190
Anxiety - Threatening to punish	0.04	0.704	0.11	0.289
Perceived Competency for Learning - Self-esteem	0.47	<0.001	0.19	0.081
Perceived Competency for Learning – Reason for Learning (Autonomy)	0.52	<0.001	0.52	<0.001
Perceived Competency for Learning – Reason for Learning (Controlled)	0.15	0.126	-0.11	0.289
Self-esteem – Reason for Learning (Autonomy)	0.29	0.002	0.18	0.098
Self-esteem – Reason for Learning	-0.08	0.411	-0.27	0.012

(Controlled)				
Self-esteem and learning				
Perceived Competency for Learning - Self-esteem	0.47	<0.001	0.19	0.081
Perceived Competency for Learning – Reason for Learning (Autonomy)	0.52	<0.001	0.52	<0.001
Perceived Competency for Learning – Reason for Learning (Controlled)	0.15	0.126	-0.11	0.289
Self-esteem – Reason for Learning (Autonomy)	0.29	0.002	0.18	0.098
Self-esteem – Reason for Learning (Controlled)	-0.08	0.411	-0.27	0.012

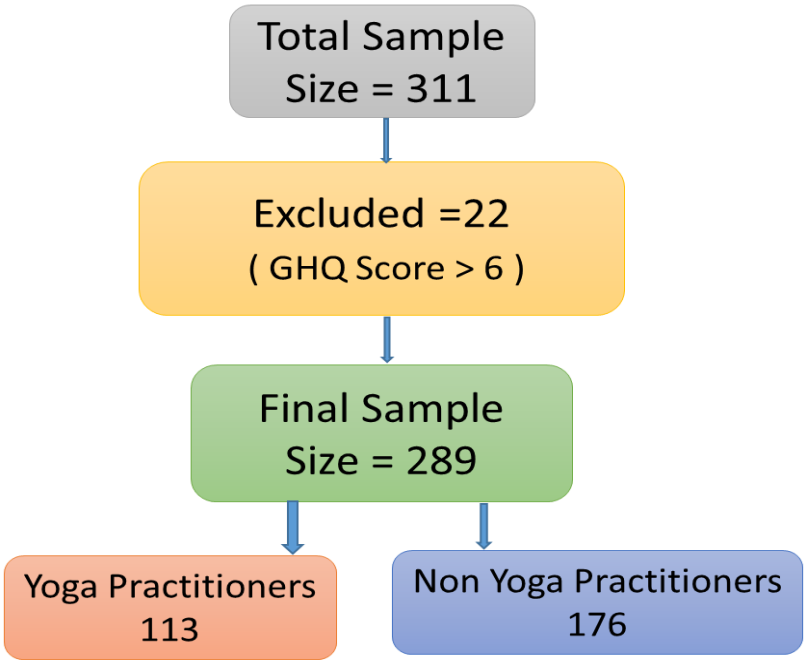
The students were divided into two categories, those having positive implicit attitude in the E-IAT (as positive score), and those having negative implicit attitude in the E-IAT (as negative score). We then performed first-order Pearson's correlation between various variables and these two categories' E-IAT scores, controlling for social desirability scores. The table 6.3 shows the results of Pearson's correlation and the corresponding p values. Overall, the magnitude of the correlation was found to be low to moderate. We therefore looked at the direction of the correlation between the two categories.

6.2. STUDY TWO

6.2.1. DESCRIPTIVE STATISTICS

Figure 6.2

Study Design of Study 2



The total sample size of the study was 311. Table 6.4 displays the means and standard deviations of psychological variables. However, we had removed 22 participants, those who had severe distress (GHQ score greater than 6). This led to a final analysable sample size of 289.

Table 6.4:

Descriptive statistics

Variables (n=311)	**Yoga (N=113)**		**Non-Yoga (N= 176)**	
	Mean	**SD**	**Mean**	**SD**
Adult attachement - Close	3.71	0.60	3.62	0.65
Adult attachement - Dependent	3.02	0.78	3.08	0.61

Adult attachement - Anxiety	2.98	0.76	3.06	0.76
Freewill - Personal Agency	3.84	0.72	3.87	0.69
Freewill - Personal Limitation	3.48	1.10	3.39	1.06
General Health Questionnaire	2.64	2.31	2.56	2.32
IDEA -Identity Exploration	3.13	0.48	3.07	0.49
IDEA - Experimentation	3.16	0.51	3.17	0.49
IDEA - Negative	2.43	0.61	2.36	0.53
IDEA - Self focused	2.98	0.42	3.01	0.41
IDEA - Others focused	2.94	0.58	2.89	0.61
IDEA - Feeling in between	2.51	0.70	2.41	0.65
Parental Behaviour - Autonomy Support	4.81	1.14	4.85	1.15
Parental Behaviour - Controlled	3.28	0.98	3.54	1.07
Social Desirability Scale	6.67	2.18	6.90	2.22

6.2.2. YOGA PRACTICE AND CAREER CHOICE

We conducted Chi square test for independence to assess any difference in proportions between the variables, yoga practice and career choice. These two demographic variables were converted to a dichotomous variable by combining their levels. Any individual who has reported no experience as non-yoga practitioners, and anybody with any duration of yoga practice as yoga practitioners. Similarly, career choice was reduced to own choice, i.e., who said they chose engineering with their own interest and choice, and other's choice, i.e., who had taken up engineering course due to the influence of either friends, parents, or teachers. Chi-square test of independence revealed no discernible difference in proportions of own choice and other's choice between yoga and non-yoga practitioners, $\chi^2(1) = 1.43$, p

= .231. Both the groups had a greater number of students who had self-reported to have joined engineering out of their own choice. We now explore the relationship between various psychological variables among yoga and non-yoga practitioners.

6.2.3. PEARSON'S PARTIAL CORRELATION

The students were divided into two categories, those who are practising yoga, and those not practising yoga. We then performed Pearson's partial correlation between various variables across yoga practitioners and non-yoga practitioners, controlling for social desirability scores. The table 6.5 shows the results of Pearson's correlation and the corresponding p values. Overall, the magnitude of the correlation was found to be low to moderate. We therefore looked at the direction of the correlation between the two categories. The results of correlation will be discussed in detail in the discussion section.

Table 6.5

Pearson's Partial Correlation across Yoga Practitioners and Non-Yoga Practitioners

(n=289)

Variable pairs			Yoga Practitioners		Non-Yoga Practitioners	
			Pearson's r	p	Pearson's r	p
Attachment style, Freewill and Determination, the IDEA and Parent scale						
Attachment Close	-	Personal Agency	0.04	0.710	0.26***	< .001
Attachment Close	-	Personal Limitation	-0.19 *	0.049	0.03	0.687
Attachment Close	-	Identity Exploration	0.06	0.527	0.20**	0.007
Attachment Close	-	Experimentation	0.12	0.213	0.16*	0.036

Attachment Close	-	Negativity	-0.05	0.630	0.15	0.052
Attachment Close	-	Self-focus	0.09	0.348	0.02	0.812
Attachment Close	-	Other-focus	-0.04	0.682	0.05	0.476
Attachment Close	-	Feeling in-between	-0.03	0.740	0.06	0.454
Attachment Close	-	Autonomy Support	0.00	0.964	0.09	0.214
Attachment Close	-	Control parenting	-0.07	0.438	0.00	0.958
Attachment Depend	-	Personal Agency	0.02	0.803	0.02	0.806
Attachment Depend	-	Personal Limitation	-0.06	0.517	-0.06	0.434
Attachment Depend	-	Identity Exploration	-0.09	0.330	-0.09	0.222
Attachment Depend	-	Experimentation	-0.11	0.230	-0.08	0.274
Attachment Depend	-	Negativity	-0.17	0.081	-0.08	0.273
Attachment Depend	-	Self-focus	0.01	0.958	-0.01	0.931
Attachment Depend	-	Other-focus	0.01	0.889	-0.13	0.100
Attachment Depend	-	Feeling in-between	-0.08	0.425	-0.07	0.333
Attachment Depend	-	Autonomy Support	0.08	0.376	0.05	0.550
Attachment Depend	-	Control parenting	-0.06	0.540	-0.03	0.738
Attachment Anxiety	-	Personal Agency	0.02	0.798	-0.06	0.403
Attachment Anxiety	-	Personal Limitation	0.04	0.683	0.12	0.101
Attachment Anxiety	-	Identity Exploration	-0.08	0.430	-0.01	0.885
Attachment Anxiety	-	Experimentation	-0.04	0.678	0.05	0.526
Attachment Anxiety	-	Negativity	0.19 *	0.049	0.20**	0.007
Attachment Anxiety	-	Self-focus	0.04	0.689	0.03	0.667
Attachment Anxiety	-	Other-focus	0.03	0.773	0.16*	0.033

Attachment Anxiety	-	Feeling in-between	0.21 *	0.024	-0.02	0.848
Attachment Anxiety	-	Autonomy Support	-0.07	0.445	-0.11	0.154
Attachment Anxiety	-	Control parenting	0.14	0.134	0.11	0.133
Freewill and Determination, the IDEA and Parent scale						
Personal Agency	-	Identity Exploration	0.43 ***	< .001	0.29***	< .001
Personal Agency	-	Experimentation	0.39 ***	< .001	0.34***	< .001
Personal Agency	-	Negativity	0.21 *	0.025	0.01	0.930
Personal Agency	-	Self-focus	0.40 ***	< .001	0.18*	0.017
Personal Agency	-	Other-focus	0.21 *	0.025	0.10	0.200
Personal Agency	-	Feeling in-between	0.16	0.095	0.09	0.217
Personal Agency	-	Autonomy Support	0.39 ***	< .001	0.22**	0.003
Personal Agency	-	Control parenting	0.00	0.979	-0.21**	0.006
Personal Limitation	-	Identity Exploration	0.09	0.355	-0.05	0.549
Personal Limitation	-	Experimentation	0.05	0.592	0.10	0.178
Personal Limitation	-	Negativity	0.13	0.179	-0.06	0.463
Personal Limitation	-	Self-focus	0.10	0.319	0.01	0.880
Personal Limitation	-	Other-focus	0.30 **	0.001	0.10	0.183
Personal Limitation	-	Feeling in-between	0.20 *	0.036	0.04	0.632
Personal Limitation	-	Autonomy Support	-0.10	0.292	-0.07	0.336
Personal Limitation	-	Control parenting	0.30 **	0.001	0.18*	0.016
The IDEA and Parent scale						
Identity Exploration	-	Autonomy Support	0.24 *	0.012	0.19*	0.014
Identity Exploration	-	Control parenting	-0.08	0.39	-0.04	0.625

Experimentation	-	Autonomy Support	0.31 ***	< .001	0.19*	0.011
Experimentation	-	Control parenting	-0.13	0.161	-0.10	0.170
Negativity	-	Autonomy Support	0.07	0.475	-0.03	0.708
Negativity	-	Control parenting	0.16	0.085	0.18*	0.018
Self-focus	-	Autonomy Support	0.30 **	0.002	0.09	0.235
Self-focus	-	Control parenting	-0.05	0.627	-0.11	0.135
Other-focus	-	Autonomy Support	0.20 *	0.033	0.05	0.507
Other-focus	-	Control parenting	0.11	0.251	-0.04	0.601
Feeling in-between	-	Autonomy Support	0.16	0.094	0.01	0.913
Feeling in-between	-	Control parenting	0.14	0.143	0.08	0.306

Conditioned on variables: SDSTOT

* p < .05, ** p < .01, *** p < .001

6.3. STUDY THREE

All raw data from the server computer were collected after completing the tests. Data were extracted from an excel sheet. In addition, all variables' data were consolidated into a single excel file, and duplicate data were deleted. Then, for the variables that required reverse scores, reverse scores were applied, and descriptive statistics were generated for all variables. For each variable, the internal consistency metric Cronbach's alpha was calculated. We used an alpha of 0.05 to test the significance of all our statistical tests. The statistical software R 4.1.0 was used to analyse the data (R Core Team, 2021).

The following variables were measured under various domains: Demographic profile, social desirability, General health, the Adult Attachment Scale, which has three sub-domains-Close, Dependent and Anxiety, and the mindful attention and awareness scale

(MAAS) and EEG. As a part of the academic curriculum, physical assessments were also done, however, they are not reported in this study.

6.3.1. DESCRIPTIVE STATISTICS

Figure 6.3

Study Design of Study 3

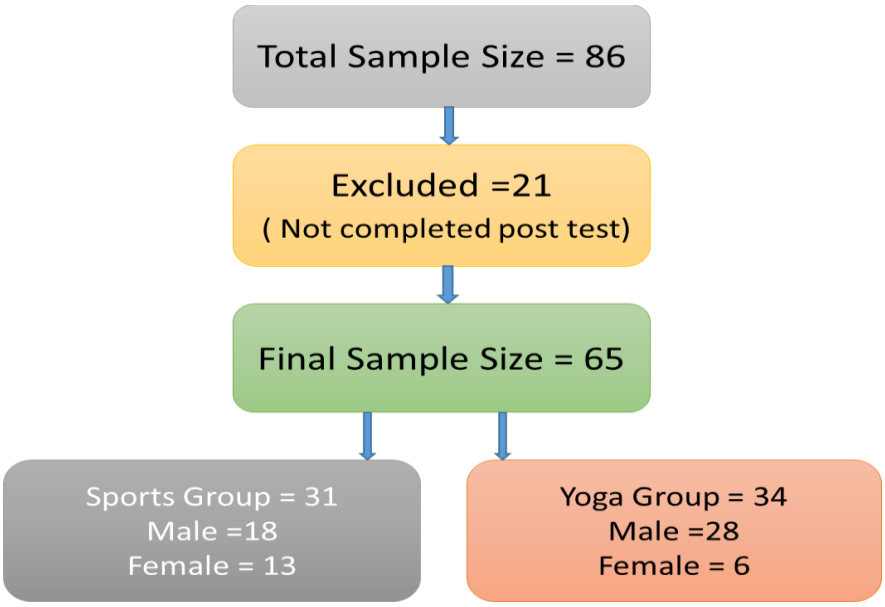


Table 6.6 displays the means and standard deviations of psychological variables and Table 6.7 displays the means and standard deviations of EEG variables. The study's overall sample size was 86, however we had to omit 21 participants since they failed to finish the post-test. This resulted in a final sample size of 65 that could be statistically analysed. Of this, 31 participants (18 men and 13 women) were in the sports group and 34 participants (28 men and 6 women) were in the yoga group.

Table 6.6

Descriptive Statistics for psychological variables

Variables	Before –Sports (N=27)		Before –Yoga (N=32)	
	Mean	SD	Mean	SD
Attachment type - Close	18.85	5.78	19.00	3.68
Attachment type - Dependent	16.59	5.21	18.25	3.78
Attachment type - Anxiety	16.85	6.24	20.03	4.53
General Health	10.26	5.31	9.69	5.68
Mindfulness - Mean	3.62	0.94	3.52	0.84
Social Desirability -Total	6.81	1.69	6.75	2.31

Table 6.7

Descriptive Statistics for EEG variables

Variables	Before –Sports N=31		After –Sports N=31		Before –Yoga N=34		After –Yoga N=34	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Attention $_{pre}$	48.21	11.86	48.83	11.88	45.06	15.47	46.89	10.69
Attention $_{during}$	49.89	6.96	50.06	6.27	47.39	14.27	47.98	11.28
Attention $_{post}$	47.18	8.13	49.59	5.85	47.80	14.64	45.50	15.49
Meditation $_{pre}$	57.68	13.24	57.66	10.38	53.25	18.23	57.88	12.90
Meditation $_{during}$	52.35	9.19	52.84	7.03	49.63	14.71	51.82	12.84
Meditation $_{post}$	53.90	9.63	53.18	6.34	48.73	14.59	51.79	17.22
Delta $_{pre}$	0.61	0.18	0.62	0.20	0.68	0.22	0.63	0.18
Delta $_{during}$	0.69	0.18	0.60	0.18	0.68	0.22	0.61	0.21

Delta post	0.69	0.23	0.63	0.23	0.65	0.24	0.59	0.21
Theta pre	0.86	0.31	0.82	0.21	0.87	0.30	0.77	0.21
Theta during	0.88	0.25	0.76	0.25	0.85	0.26	0.77	0.24
Theta post	0.89	0.34	0.76	0.25	0.77	0.30	0.72	0.28
Low Alpha pre	0.66	0.25	0.63	0.25	0.67	0.28	0.56	0.29
Low Alpha during	0.59	0.27	0.49	0.23	0.59	0.30	0.50	0.24
Low Alpha post	0.61	0.33	0.46	0.28	0.51	0.31	0.50	0.29
High Alpha pre	0.68	0.28	0.59	0.29	0.72	0.31	0.63	0.33
High Alpha during	0.60	0.27	0.46	0.25	0.61	0.31	0.51	0.25
High Alpha post	0.55	0.28	0.44	0.26	0.54	0.29	0.51	0.29
Low Beta pre	0.20	0.16	0.18	0.17	0.19	0.20	0.22	0.22
Low Beta during	0.19	0.15	0.16	0.17	0.17	0.18	0.19	0.21
Low Beta post	0.17	0.14	0.15	0.21	0.14	0.16	0.17	0.23
High Beta pre	0.10	0.13	0.11	0.15	0.13	0.22	0.14	0.16
High Beta during	0.08	0.09	0.10	0.15	0.13	0.22	0.15	0.22
High Beta post	0.04	0.06	0.10	0.19	0.14	0.29	0.17	0.28
High Gamma pre	0.03	0.04	0.06	0.09	0.04	0.08	0.06	0.07
High Gamma during	0.04	0.04	0.06	0.07	0.04	0.06	0.05	0.07
High Gamma post	0.03	0.03	0.06	0.09	0.04	0.11	0.06	0.09
Mid Gamma pre	0.11	0.28	0.24	0.36	0.09	0.12	0.11	0.21
Mid Gamma during	0.07	0.09	0.10	0.11	0.08	0.15	0.08	0.14
Mid Gamma post	0.05	0.05	0.07	0.10	0.07	0.19	0.07	0.18

We conducted “2 x 3 repeated-measures ANOVA”, with yoga and sports (group) as a between-group factor; pre, during and post-meditation period (time) as a within-group factor. We have reported the results of the main effects of group and time, in table 6.8. Further post hoc tests were carried out using paired samples t-tests with Bonferroni corrections to control for multiple comparisons. Bonferroni adjusted p-value, p_{bonf} is reported. The raw data and the R analysis script for this study can be downloaded from https://osf.io/5rpk3/?view_only=c96fdf6eb757477abfe96ea84eaf0405.

There was a noticeable difference in the EEG variable ‘meditation state’ within sessions (pre-during-post) in both the groups (yoga and sports) at the baseline (Sports mean: M_{pre}=57.68; M_{during}=52.35; M_{post}=53.9, Yoga mean: M_{pre}=57.66; M_{during}=52.84; M_{post}=53.18, p=0.001). Post hoc tests showed that the difference between the pre-during session (p_{bonf}=0.001) and the pre-post session (p_{bonf}=0.037) was statistically significant. After the intervention, similar results were found, in both the groups (Sports mean: M_{pre}=53.25; M_{during}=49.63; M_{post} =48.73, Yoga mean: M_{pre}=57.88; M_{during}=51.82; M_{post}=51.79, p=0.003). Post hoc tests showed that the difference between the pre-during session (p_{bonf}=0.002) and pre-post session (p_{bonf}=0.017) were statistically significant. However, the sports group shown a noticeable difference in the post-test scores, whereas the yoga group had a marginal difference.

There was noticeable difference within sessions in both the groups in Low Alpha state at the baseline (Sports mean: M_{pre}=0.66; M_{during}=0.59; M_{post}=0.61, Yoga mean: M_{pre}=0.63; M_{during}=0.49; M_{post}=0.46, p<0.001). Post hoc tests showed that difference between the pre-during session (p_{bonf}=<0.001) and pre-post session (p_{bonf}=0.002) was statistically significant. Post-test results have also showed noticeable difference within sessions in both

the groups in Low Alpha state (Sports mean: M_{pre}=0.67; M_{during}=0.59; M_{post}=0.51, Yoga mean: M_{pre}=0.56; M_{during}=0.5; M_{post}=0.5, $p<0.001$). Post hoc tests showed that the difference between the pre-during session (p_{bonf}=0.025) and the pre-post session (p_{bonf}=0.004) was statistically significant. The sports group demonstrated a noticeable change at the end of the session, but the yoga group demonstrated a noticealbe difference at the beginning of the session, according to the post-test data. Similarly, there was a noticeable difference within sessions in both the groups in the High Alpha state at the baseline ($p<0.001$). Post hoc tests showed that the difference between the pre-during session (p_{bonf}=0.001) and pre-post session (p_{bonf}=<0.001) were statistically significant. Post-test results have also shown significant differences within sessions in both the groups in the High Alpha state ($p<0.001$). Post hoc tests showed that the difference between the pre-during session (p_{bonf}=0.001) and pre-post session (p_{bonf}=<0.001) were statistically significant.

There was a noticeable difference in between groups in High Gamma state at the baseline (Sports mean: M_{pre}=0.03; M_{during}=0.04; M_{post}=0.03, Yoga mean: M_{pre}=0.06; M_{during}=0.06; M_{post}=0.06, $p=0.047$). But there was no notceable difference in post-test between groups in terms of High Gamma state. There was a noticeable difference within sessions in both the groups in Mid Gamma state at the baseline (Sports mean: M_{pre}=0.11; M_{during}=0.07; M_{post}=0.05, Yoga mean: M_{pre}=0.24; M_{during}=0.1; M_{post}=0.07, $p=0.004$). Post hoc tests showed that the difference between the pre-during session (p_{bonf}=0.013) and pre-post session (p_{bonf}=0.012) was statistically significant. However, following the intervention, there was no noticeable difference in both groups' Mid Gamma states across sessions. Other variables did not significantly differ between the two groups either.

We used independent samples t-test to evaluate any difference in psychological variables (assessed only at the baseline) between yoga and sports groups. The results showed no statistical difference between yoga and sports groups for all the psychological variables.

6.3.2. REPEATED MEASURES ANOVA BEFORE AND AFTER THE INTERVENTION ON EEG VARIABLES.

Table 6.8

Repeated Measures ANOVA before and after the intervention on EEG variables.

Variables	Main Effect	Pre	Post
Attention	Group	F(1,63)= 0.45, p=0.503, es=0.01	F(1,63)= 0.00, p=0.990, es=0.00
Attention	Time	F(1.39,87.43)= 0.90, p=0.377, es=0.01	F(1.5,94.25)= 0.95, p=0.366, es=0.02
Meditation	Group	F(1,63)= 0.00, p=0.964, es=0.00	F(1,63)= 0.99, p=0.323, es=0.02
Meditation	Time	F(1.49,93.64)= 8.43, p=0.001, es=0.12	F(1.69,106.32)=6.99, p=0.003, es=0.10
Delta	Group	F(1,63)= 1.59, p=0.213, es=0.03	F(1,63)= 2.15, p=0.147, es=0.03
Delta	Time	F(1.64,103.36)= 1.14, p=0.316, es=0.02	F(1.83,114.98)= 0.81, p=0.437, es=0.01
Theta	Group	F(1,63)= 2.55, p=0.116, es=0.04	F(1,63)= 2.08, p=0.154, es=0.03
Theta	Time	F(2,126)=0.34, p=0.712, es=0.01	F(1.77,111.25)= 3.21, p=0.050, es=0.05
Low Alpha	Group	F(1,63)= 2.16, p=0.147, es=0.03	F(1,63)= 1.31, p=0.257, es=0.02
Low Alpha	Time	F(1.66,104.81)= 11.76, p=0.000, es=0.16	F(2,126)= 8.06, p=0.001, es=0.11

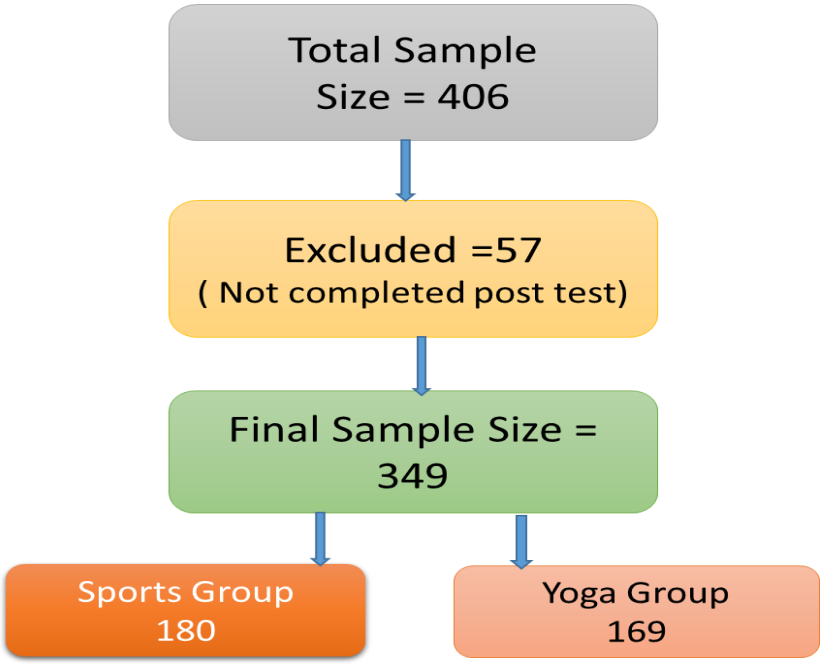
High Alpha	Group	F(1,63)= 3.66, p=0.060, es=0.06	F(1,63)= 1.28, p=0.262, es=0.02
High Alpha	Time	F(1.69,106.29)= 14.74, p=0.000, es=0.19	F(1.63,102.67)= 15.39, p=0.000, es=0.20
Low Beta	Group	F(1,63)=0.46, p=0.500, es=0.01	F(1,63)= 0.26, p=0.615, es=0.00
Low Beta	Time	F(1.53,96.11)= 1.12, p=0.319, es=0.02	F(1.51,95.03)= 2.13, p=0.137, es=0.03
High Beta	Group	F(1,63)= 1.14, p=0.289, es=0.02	F(1,63)=0.11, p=0.741, es=0.00
High Beta	Time	F(1.56,98.23)=1.95, p=0.157, es=0.03	F(1.31,82.24)=0.42, p=0.572, es=0.01
High Gamma	Group	F(1,63)= 4.12, p=0.047, es=0.06	F(1,63)= 0.82, p=0.368, es=0.01
High Gamma	Time	F(1.48,93.19)= 0.06, p=0.890, es=0.00	F(2,126)= 0.59, p=0.559, es=0.01
Mid Gamma	Group	F(1,63)=2.62, p=0.111, es=0.04	F(1,63)= 0.05, p=0.821, es=0.00
Mid Gamma	Time	F(1.07,67.57)=8.44, p=0.004, es=0.12	F(1.32,82.9)= 0.71, p=0.438, es=0.01

6.4. STUDY FOUR

6.4.1. DESCRIPTIVE STATISTICS

Figure 6.4

Study Design of Study 4



Descriptive statistics were done. The study's total sample size was 406, however 57 participants had to be dropped since they failed to complete the post-test. This resulted in a final sample size that can be used for analysis of 349, including 169 individuals in the yoga group and 180 people in the sports group.

Table 6.9

Group Descriptives

Variable	Group	Pre Intervention			Post Intervention		
		N	Mean	SD	N	Mean	SD
SDSTotal	S	206	7.27	2.06	185	7.45	2.05
	Y	201	7.35	2.00	169	7.31	2.22

PCLavg	S	206	6.17	1.08	185	6.10	1.19
	Y	201	6.12	1.21	169	5.82	1.39
GuTotal	S	192	23.56	2.28	185	23.54	2.38
	Y	192	23.03	2.46	168	22.96	2.50
GHQScore	S	192	13.20	4.34	185	14.49	3.52
	Y	192	13.70	4.97	168	14.39	3.44
IdeaIE	S	192	2.94	0.43	185	3.06	0.43
	Y	192	2.98	0.52	168	3.03	0.49
IdeaEP	S	192	3.29	0.45	185	3.26	0.46
	Y	192	3.14	0.55	168	3.25	0.53
IdeaNI	S	192	2.34	0.58	185	2.49	0.52
	Y	192	2.51	0.62	168	2.49	0.57
IdeaOF	S	192	2.81	0.64	185	2.78	0.65
	Y	192	2.80	0.65	168	2.79	0.65
IdeaSF	S	192	3.27	0.47	185	3.27	0.43
	Y	192	3.21	0.49	168	3.12	0.49
IdeaFIB	S	192	2.92	0.59	185	2.93	0.57
	Y	192	2.88	0.64	168	2.81	0.65
DiffEP	S	-	-	-	172	-0.05	0.49
	Y	-	-	-	160	0.07	0.64
DiffNI	S	-	-	-	172	0.14	0.56
	Y	-	-	-	160	0.01	0.60
DiffGuna	S	-	-	-	172	0.01	2.52
	Y	-	-	-	160	-0.08	2.68

S = *Sports Group*, **Y** = *Yoga Group*

SDS: *Social Desirability Scale.* ***PCL:*** *Perceived Competency for Learning.* ***Gu:*** *Guṇas.* ***GHQ:*** *General Health Questionnaire. "**Idea:** Inventory of Dimensions of Emerging Adulthood" – "**IE:** Identity Exploration, **EP:** Experimentation/Possibilities, **NI:***

Negativity/Instability, ***OF:*** *Other-Focused,* ***SF:*** *Self-Focused,* ***FIB:*** *Feeling In-Between".*

Diff: *Diffenence.*

6.4.2. MANN-WHITNEY U TEST

Table 6.10

Mann-Whitney U test

Variable	Pre intervention			Post intervention		
	W	p	Rank-Biserial Correlation	W	p	Rank-Biserial Correlation
SDSTotal	19977.00	0.537	-0.035	16150.50	0.587	0.033
PCLavg	20699.00	0.998	0.000	17609.50	0.033	0.126
GuTotal	20695.00	0.036	0.123	17451.50	0.044	0.123
GHQScore	17779.00	0.548	-0.035	15602.50	0.948	0.004
IdeaIE	17366.00	0.325	-0.058	15715.50	0.854	0.011
IdeaEP	21225.50	0.010	0.152	15292.00	0.794	-0.016
IdeaNI	15607.50	0.009	-0.153	15850.00	0.746	0.020
IdeaOF	18583.50	0.888	0.008	15088.50	0.634	-0.029
IdeaSF	20039.00	0.137	0.087	18238.00	0.005	0.174
IdeaFIB	19052.00	0.563	0.034	17027.00	0.115	0.096
DiffEP	-	-	-	12240.50	0.081	-0.110
DiffNI	-	-	-	15478.00	0.049	0.125
DiffGuna	-	-	-	14291.50	0.540	0.039

Note. "For the Mann-Whitney test, effect size is given by the rank biserial correlation".

Note. "Mann-Whitney U test".

SDS: Social Desirability Scale. **PCL:** Perceived Competency for Learning. **Gu:** *Guṇas*. **GHQ:** General Health Questionnaire. "**Idea:** Inventory of Dimensions of Emerging Adulthood" – "**IE:** Identity Exploration, **EP:** Experimentation/Possibilities, **NI:** Negativity/Instability, **OF:** Other-Focused, **SF:** Self-Focused, **FIB:** Feeling In-Between", ***Diff:*** *Diffenence.*

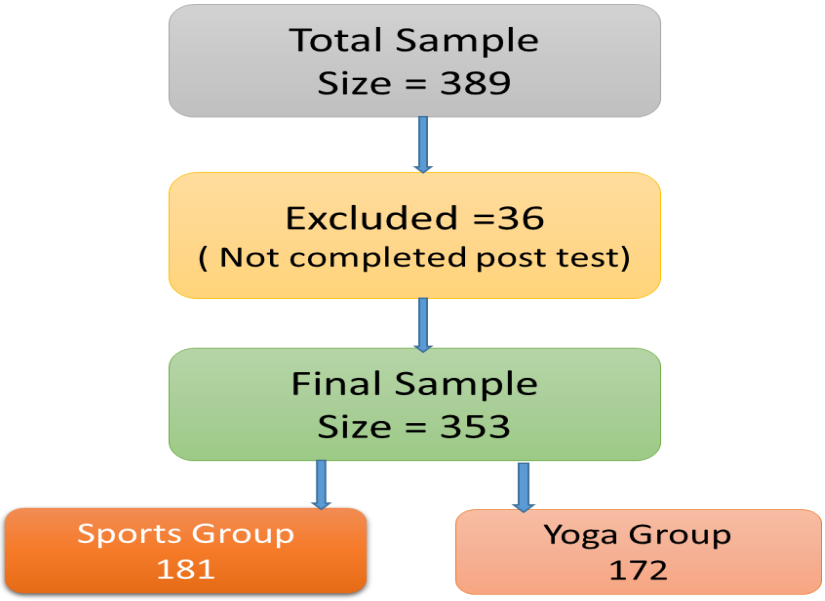
There was significant difference in perceived competency for learning (p=0.033; mean: S=6.10, Y=5.82), *Guṇa* (p=0.044; mean: S=23.54, Y=22.96), self focused (p=0.005; mean: S=3.27, Y=3.12) and Difference Negatigity/Instability (p=0.049; mean: S=0.14, Y=0.01) in sports group than in yoga group.

6.5. STUDY FIVE

6.5.1. DESCRIPTIVE STATISTICS

Figure 6.5

Study Design of Study 5



Descriptive statistics were done. The study's total sample size was 389, however 36 participants had to be dropped since they failed to complete the post-test. This resulted in a final sample size of 353 that may be analysed, including 172 participants in the yoga group and 181 people in the sports group.

Table 6.11

Group Descriptives

Variable	Group	Pre intervention			Post intervention		
		N	Mean	SD	N	Mean	SD
SDSTotal	S	194	7.31	2.13	181	0.60	0.49
	Y	195	6.93	2.18	173	0.61	0.49
ASTotal	S	194	56.55	7.85	181	56.19	6.91
	Y	195	57.32	6.90	173	56.61	6.70
ASCLOSE	S	194	20.70	4.24	181	20.74	3.82
	Y	195	20.89	3.66	173	20.49	3.88
ASDEPEND	S	194	18.33	4.41	181	18.03	3.91
	Y	195	18.75	3.70	173	18.30	3.59
ASANXIETY	S	194	17.53	5.16	181	17.43	5.06

	Y	195	17.68	5.06	173	17.82	5.08
GuTotal	S	190	23.28	2.47	179	22.66	1.97
	Y	192	23.15	2.52	170	22.68	2.14
GHQScore	S	190	23.14	4.23	179	14.33	3.44
	Y	192	19.97	6.42	170	14.98	3.42
IdeaIE	S	190	2.93	0.44	179	3.02	0.48
	Y	192	2.94	0.50	170	2.88	0.50
IdeaEP	S	190	3.25	0.50	179	3.26	0.55
	Y	192	3.04	0.55	170	3.12	0.57
ideaNI	S	190	2.42	0.56	179	2.44	0.58
	Y	192	2.51	0.58	170	2.44	0.54
IdeaOF	S	190	2.74	0.70	179	2.67	0.62
	Y	192	2.81	0.70	170	2.78	0.62
IdeaSF	S	190	3.22	0.46	179	3.21	0.50
	Y	192	3.11	0.52	170	3.05	0.51
IdeaFIB	S	190	2.79	0.67	179	2.90	0.66
	Y	192	2.76	0.64	170	2.85	0.62
DiffEP	S	-	-	-	175	0.02	0.58
	Y	-	-	-	167	0.07	0.66
DiffGuna	S	-	-	-	175	-0.67	2.19
	Y	-	-	-	167	-0.64	2.98

S = *Sports Group*, **Y** = *Yoga Group*

SDS: *Social Desirability Scale.* ***PCL:*** *Perceived Competency for Learning.* ***Gu:*** *Guṇa.* ***GHQ:*** *General Health Questionnaire. "**Idea:** Inventory of Dimensions of Emerging Adulthood – **IE:** Identity Exploration, **EP**: Experimentation/Possibilities, **NI:** Negativity/Instability, **OF:** Other-Focused, **SF:** Self-Focused, **FIB:** Feeling In-Between",* ***Diff:*** *Diffenence.*

6.5.2. MANN-WHITNEY U TEST

Table 6.12

Mann-Whitney U test

Variable	Pre intervention			Post intervention		
	W	p	Rank-Biserial Correlation	W	p	Rank-Biserial Correlation
SDSTotal	21017.50	0.056	0.111	15582.50	0.928	-0.005
ASTOTAL	18422.50	0.657	-0.026	15188.50	0.627	-0.030
ASCLOSE	18805.50	0.921	-0.006	16154.00	0.604	0.032
ASDEPEND	18192.00	0.513	-0.038	15306.00	0.715	-0.022
ASANXIETY	19000.50	0.939	0.005	14717.00	0.328	-0.060
GuTotal	18753.50	0.632	0.028	15121.00	0.920	-0.006
GHQSCORE	23100.50	< .001	0.266	13721.50	0.111	-0.098
IdeaIE	18061.00	0.868	-0.010	17903.00	0.004	0.177
IdeaEP	22560.00	< .001	0.237	17552.50	0.013	0.154
ideaNI	16500.00	0.106	-0.095	15034.00	0.848	-0.012
IdeaOF	16823.00	0.184	-0.078	13734.50	0.112	-0.097
IdeaSF	20199.00	0.068	0.107	18293.50	0.001	0.202
IdeaFIB	19014.00	0.468	0.042	16028.50	0.380	0.053
DiffEP	-	-	-	13718.00	0.326	-0.061
DiffGuna	-	-	-	14501.50	0.903	-0.008

Note. "For the Mann-Whitney test, effect size is given by the rank biserial correlation".

Note. "Mann-Whitney U test".

SDS: *Social Desirability Scale.* ***PCL:*** *Perceived Competency for Learning.* ***Gu:*** *Guṇa.* ***GHQ:*** *General Health Questionnaire. "****Idea:*** *Inventory of Dimensions of Emerging Adulthood –* ***IE:*** *Identity Exploration,* ***EP****: Experimentation/Possibilities,* ***NI:*** *Negativity/Instability,* ***OF:*** *Other-Focused,* ***SF:*** *Self-Focused,* ***FIB:*** *Feeling In-Between",* ***Diff:*** *Diffenence.*

There was significant difference in identity exploration (p=0.004; mean: S=3.02, Y=2.88), experimentation/possibilities (p=0.013; mean: S=3.26, Y=3.12) and self focused (p=0.001; mean: S=3.21, Y=3.05) in sports group than in yoga group.