

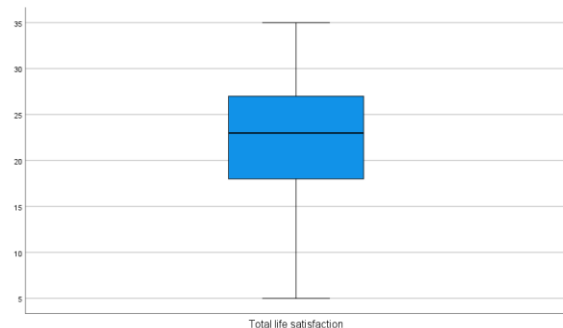
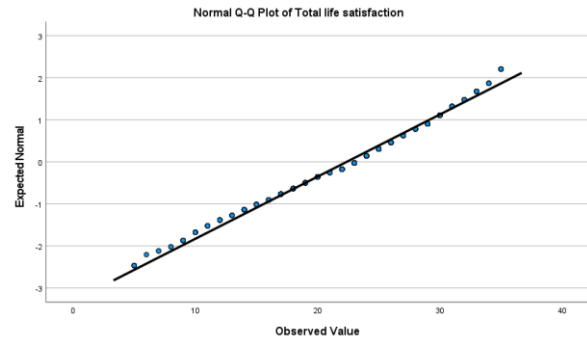
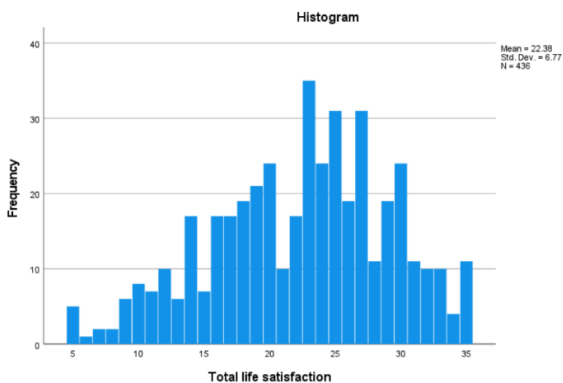
In submitting this work, I confirm that it is entirely my own. I acknowledge that I may be invited to an online interview if there is any concern in relation to the integrity of my submission, and I am aware that any breach will be subject to the University's Procedures for dealing with breaches of Exam Regulations. I am aware of what the NUI Galway plagiarism policy entails.

## Question 1: Is the continuous variable Total Life Satisfaction distributed normally?

**Statistical Test:** Here, to verify the **Normality**, we will use a continuous variable called overall life satisfaction and map it to a label ID and show the results using

### 1. Histogram 2. Boxplot 3. Kolmogorov-Smirnov and Q-Q plot.

*Fig 1.1 Histogram, Normal Q-Q plot, and Box plot of Total like Satisfaction*



- The histogram is shaped nearly like a bell-shaped figure with a few dips in the center.
- The Q-Q plot of total life satisfaction demonstrates that there is no huge difference between the expected value and the observed value, demonstrating that it is normally distributed.
- The box plot shows a low value of around 5 and a high value of around 35 without any IDs present so there is no need to perform further analysis.

*Fig 1.2 Shows the mean and 5% trimmed mean*

Descriptives			
		Statistic	Std. Error
Total life satisfaction	Mean	22.38	.324
	95% Confidence Interval for Mean	Lower Bound	21.74
		Upper Bound	23.02
	5% Trimmed Mean	22.52	
	Median	23.00	
	Variance	45.827	
	Std. Deviation	6.770	
	Minimum	5	
	Maximum	35	
	Range	30	
Total life satisfaction	Interquartile Range	9	
	Skewness	-.323	.117
	Kurtosis	-.450	.233

*Fig 1.3 Kolmogorov-Smirnov Test of Normality*

Tests of Normality						
	Kolmogorov-Smirnov <sup>a</sup>			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Total life satisfaction	.087	436	.000	.982	436	.000
a. Lilliefors Significance Correction						

- The Kolmogorov-Smirnov test has a significance=.000 that is less than 0.05 which shows this statistic is significant.
- Even though the Kolmogorov-Smirnov test is not satisfied, we still treat this continuous variable as having a normal

distribution because the other tests has succeeded.

**From Fig 1.2** we can see that the mean for total life satisfaction=22.38 and the 5% trimmed=22.52 which seems fairly close. The 5% trimmed implied that we cut off 2.5% from the left and right side of the histogram and we have the mean for the remaining 95%. When we extract the very low and high answers, we get an average of 22.52. We can also see Skewness=-.323 which implies it is skewed toward the right and Kurtosis=-.450 which implies it is a flat curve. **Final thoughts:** Given that the majority of the results support this, we are assuming that total life satisfaction is normally distributed.

**Question2:** Are the Perceived Stress Scale items correlated with each other and are they reliable?

**Statistical Test:** Here, to test if that items are reliable and can be constructed together, we are using **Reliability Analysis** which should show **Cronbach's Alpha** value of at least 0.7

**Fig 2.1 Reliability Stats with Cronbach's Alpha**

Reliability Statistics		
Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.360	.287	10

**Fig 2.2 Item Stats table**

Item Statistics			
	Mean	Std. Deviation	N
pss1	2.84	.876	433
pss2	2.74	.959	433
pss3	3.16	.926	433
pss4	3.80	.783	433
pss5	3.47	.805	433
pss6	2.77	.957	433
pss7	3.54	.751	433
pss8	3.54	.805	433
pss9	3.05	.992	433
pss10	2.51	1.014	433

The item statistics show all ten items of the perceived stress scale along with mean and Standard deviation and we can see that Cronbach's alpha=0.360 which is < 0.7 indicating the items don't have good reliability and correlation.

**Fig 2.3 Correlation matrix shows how the level of total perceived stress are correlated with each other**

Inter-Item Correlation Matrix										
	pss1	pss2	pss3	pss4	pss5	pss6	pss7	pss8	pss9	pss10
pss1	1.000	.445	.409	-.189	-.289	.281	-.232	-.266	.430	.374
pss2	.445	1.000	.485	-.343	-.388	.357	-.332	-.433	.363	.483
pss3	.409	.485	1.000	-.307	-.288	.475	-.318	-.424	.405	.535
pss4	-.189	-.343	-.307	1.000	.485	-.208	.466	.526	-.212	-.329
pss5	-.289	-.388	-.288	.485	1.000	-.241	.361	.625	-.230	-.356
pss6	.281	.357	.475	-.208	-.241	1.000	-.281	-.413	.277	.528
pss7	-.232	-.332	-.318	.466	.361	-.281	1.000	.483	-.245	-.394
pss8	-.266	-.433	-.424	.526	.625	-.413	.483	1.000	-.246	-.482
pss9	.430	.363	.405	-.212	-.230	.277	-.245	-.246	1.000	.393
pss10	.374	.483	.535	-.329	-.356	.528	-.394	-.482	.393	1.000

From Correlation matrix we can see that each item completely corresponds with itself, as seen by the inter-item correlation matrix. When we dig deeper, we find that pss1 and pss2 have a correlation of 0.445, which looks low and suggests that they are not related. According to statistics, if the value is higher than 0.5, we may say that the variables are related, but if it is lower than 0.5, they are not.

From the Item-total statistics when you look at the "Cronbach's alpha if the item deleted" column we can incur that since none of the item's values is greater than 0.7 then deleting them will not impact the overall Cronbach's alpha value.

**Fig 2.4 Item total stats table**

Item-Total Statistics					
	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
pss1	28.58	9.032	.370	.316	.231
pss2	28.67	9.193	.281	.399	.265
pss3	28.25	8.720	.397	.435	.211
pss4	27.61	11.697	-.105	.378	.420
pss5	27.94	11.997	-.161	.447	.441
pss6	28.64	9.037	.312	.356	.250
pss7	27.87	12.208	-.195	.326	.445
pss8	27.88	12.535	-.252	.559	.470
pss9	28.36	8.718	.349	.280	.227
pss10	28.90	8.786	.322	.477	.239

For example, when we delete the value of pss1 then Cronbach's alpha value will drop down to 0.231 so there will not be any significant change. **Final thoughts:** Cronbach's alpha <0.7, the items are not correlated and cannot to folded together to form a single construct.

**Question3:** Do more men complete higher education than women and are there a significant difference between gender taking higher education?

**Statistical Test:** In this scenario, we are utilizing **Chi Square** since we are considering two categorical variables such as higher education completed and gender

**Fig 3.1 Gender Vs Higher education completed summary**

Case Processing Summary						
	Valid		Cases Missing		Total	
	N	Percent	N	Percent	N	Percent
sex * highest educ completed	439	100.0%	0	0.0%	439	100.0%

There are no unsolved cases, and all of the questions have been addressed (439). The crosstab displays the proportion of men and women with higher education degrees (from primary – to Postgraduate)

**Fig 3.2 Show Chi-square test with Pearson value as well as Phi and Cramer's V value**

Chi-Square Tests			
	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	15.361 <sup>a</sup>	5	.009
Likelihood Ratio	16.647	5	.005
Linear-by-Linear Association	9.933	1	.002
N of Valid Cases	439		

a. 2 cells (16.7%) have expected count less than 5. The minimum expected count is .84.

Symmetric Measures			
		Value	Approximate Significance
Nominal by Nominal	Phi	.187	.009
	Cramer's V	.187	.009
N of Valid Cases		439	

The value of chi-square=15.361 and the significance=0.009 which is lesser than p=0.05 which means its significant. We do not have yates' continuity as it's not a 2x2 table. Since p <0.05 it means the proportion of males who go to higher education is significantly different from the proportion of females who goes to higher education. The Phi and Cramer's V also support the point that the values are significant as we can see the approximate significance for both the tests are lesser than 0.05.

**Final thoughts:** Based on the significance value in Pearson chi-square and Phi and Cramer's V we can conclude that there is significant difference in gender taking higher education

**Fig 3.2 Crosstab of Gender Vs Higher education completed**

**sex \* highest educ completed Crosstabulation**

			highest educ completed						Total
			PRIMARY	SOME SECONDARY	COMPLETED HIGH SCHOOL	SOME ADDITIONAL TRAINING	COMPLETED UNDERGRADUATE	POSTGRADUATE COMPLETED	
sex	MALES	Count	<3	12	38	49	54	32	185
		% within sex	n<3	6.5%	20.5%	26.5%	29.2%	17.3%	100.0%
		% within highest educ completed	n<3	22.6%	44.7%	40.8%	43.9%	57.1%	42.1%
		% of Total	n<3	2.7%	8.7%	11.2%	12.3%	7.3%	42.1%
	FEMALES	Count	<3	41	47	71	69	24	254
		% within sex	n<3	16.1%	18.5%	28.0%	27.2%	9.4%	100.0%
		% within highest educ completed	n<3	77.4%	55.3%	59.2%	56.1%	42.9%	57.9%
		% of Total	n<3	9.3%	10.7%	16.2%	15.7%	5.5%	57.9%
Total	Count		<3	53	85	120	123	56	439
	% within sex		n<3	12.1%	19.4%	27.3%	28.0%	12.8%	100.0%
	% within highest educ completed		100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
	% of Total		n<3	12.1%	19.4%	27.3%	28.0%	12.8%	100.0%

The degree of freedom shows each person could have completed five levels of higher education or vice versa. This means males/females can complete either high school or training or both.

**Question4:** How does two continuous independent variable total life satisfaction and total optimism measure one dependent variable total self-esteem and which IV has more influence on DV?

**Statistical Test:** We are using **multiple regression** to determine which of the two independent variables, total life satisfaction, and total optimism, contributes more towards the dependent variable total self-esteem. Based on the correlation table we can see the two IVs correlate with the DV in a very fair manner with 0.488 and 0.565 respectively which is not very high.

**Fig 4.1 Correlation table**

**Correlations**

		Total Self esteem	Total Optimism	Total life satisfaction
Pearson Correlation	Total Self esteem	1.000	.565	.488
	Total Optimism	.565	1.000	.483
	Total life satisfaction	.488	.483	1.000
Sig. (1-tailed)	Total Self esteem	.	.000	.000
	Total Optimism	.000	.	.000
	Total life satisfaction	.000	.000	.
N	Total Self esteem	436	433	434
	Total Optimism	433	435	435
	Total life satisfaction	434	435	436

In the coefficients table, we are looking for the tolerance and VIF where tolerance is 0.767 which is >0.1 and VIF is 1.304 which is <10 in turn suggests that the variables do not have multi-linearity.

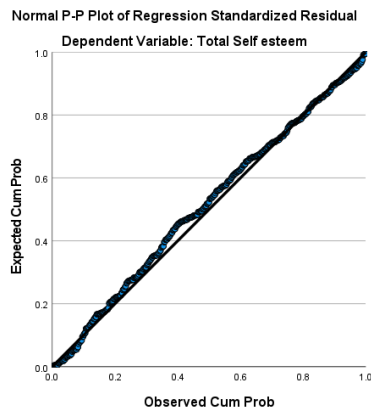
**Fig 4.2 Coefficients table shows the tolerance and VIF of the two independent variables**

**Coefficients<sup>a</sup>**

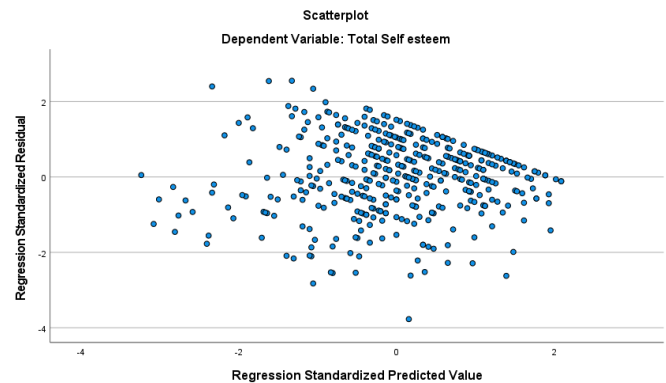
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95.0% Confidence Interval for B		Correlations			Collinearity Statistics	
		B	Std. Error	Beta			Lower Bound	Upper Bound	Zero-order	Partial	Part	Tolerance	VIF
1	(Constant)	16.958	1.064		15.934	.000	14.866	19.050					
	Total Optimism	.523	.053	.429	9.895	.000	.419	.627	.565	.431	.376	.767	1.304
	Total life satisfaction	.224	.035	.281	6.475	.000	.156	.292	.488	.298	.246	.767	1.304

a. Dependent Variable: Total Self esteem

**Fig 4.3 Expected Vs Observed Probability P-P plot**



**Fig 4.4 Scatterplot**



The normal probability method between the observed cumulative probability vs expected cumulative probability plot demonstrates that it is extremely well aligned in a straight line and the scatterplot demonstrates that there are clusters created around the zero mark.

The amount of variance in the DV predicted by the individual variables can be found in the adjusted R-square table,

**Fig 4.4 Show Adjusted R square value to determine the dependency**

**Model Summary<sup>b</sup>**

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	R Square Change	Change Statistics			Sig. F Change
						F Change	df1	df2	
1	.616 <sup>a</sup>	.380	.377	4.259	.380	131.582	2	430	.000

a. Predictors: (Constant), Total life satisfaction, Total Optimism

b. Dependent Variable: Total Self esteem

The adjusted R-square shows a value of 0.337, indicating that the two independent variables, total life satisfaction, and total optimization, account for 37.7% of the variance in the variable total self-esteem, leaving the remaining 42.3% reliant on other variables. **Final thoughts:** The ANOVA tables below show significance =0.000 which is less than  $p=0.05$  which means the IVs are good predictors. The coefficient table shows the beta values, with total optimism equaling 0.429 and total life satisfaction equaling 0.281. Both values are statistically significant, however, total optimism has a 42.9% contribution that is more favorable to total self-esteem.

**Question5:** How do multiple variables in the perceived stress associated with each other based on correlation?

**Statistical Test:** Since the perceived stress scale comprises more than five items, **factor analysis** is being used to do the study.

The correlation matrix shows that each item correlates with itself, and we have many correlations  $>0.3$ . The Kaiser-Meyer Olkin measure is 0.881 which is  $>0.6$  and Bartlett's test shows that these values are significant.

**Fig 5.1 Correlation matrix of perceived stress**

Correlation Matrix											
		pss1	pss2	pss3	pss4	pss5	pss6	pss7	pss8	pss9	pss10
Correlation	pss1	1.000	.445	.409	-.189	-.289	.281	-.232	-.266	.430	.374
	pss2	.445	1.000	.485	-.343	-.388	.357	-.332	-.433	.363	.483
	pss3	.409	.485	1.000	-.307	-.288	.475	-.318	-.424	.405	.535
	pss4	-.189	-.343	-.307	1.000	.485	-.208	.466	.526	-.212	-.329
	pss5	-.289	-.388	-.288	.485	1.000	-.241	.361	.625	-.230	-.356
	pss6	.281	.357	.475	-.208	-.241	1.000	-.281	-.413	.277	.528
	pss7	-.232	-.332	-.318	.466	.361	-.281	1.000	.483	-.245	-.394
	pss8	-.266	-.433	-.424	.526	.625	-.413	.483	1.000	-.246	-.482
	pss9	.430	.363	.405	-.212	-.230	.277	-.245	-.246	1.000	.393
	pss10	.374	.483	.535	-.329	-.356	.528	-.394	-.482	.393	1.000

**Fig 5.2 Kaiser-Meyer-Olkin and Bartlett's Test**

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.881
Bartlett's Test of Sphericity	Approx. Chi-Square	1480.357
	df	45
	Sig.	.000

Two items with eigenvalues greater than one and percentages of 43.65% and 12.70%, respectively, may be seen when we look at the principal component analysis. In contrast, there is just one primary component when examining the scree plot, and other components are grouped.

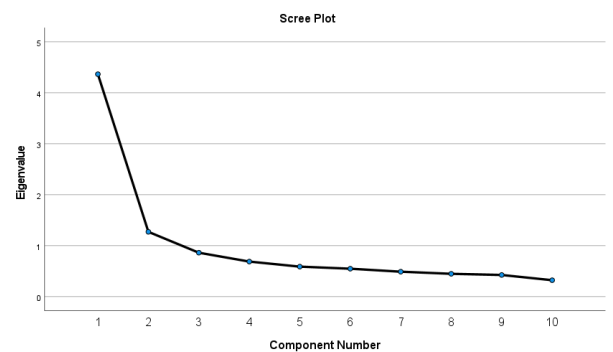
**Fig 5.3 Tables shows Eigen values and variance**

Total Variance Explained							
Component	Total	Initial Eigenvalues		Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings <sup>a</sup>
		% of Variance	Cumulative %	Total	% of Variance	Cumulative %	
1	4.365	43.650	43.650	4.365	43.650	43.650	3.686
2	1.271	12.709	56.358	1.271	12.709	56.358	3.395
3	.861	8.612	64.970				
4	.687	6.869	71.839				
5	.588	5.877	77.717				
6	.547	5.472	83.189				
7	.488	4.884	88.073				
8	.447	4.472	92.544				
9	.424	4.240	96.785				
10	.322	3.215	100.000				

Extraction Method: Principal Component Analysis.

a. When components are correlated, sums of squared loadings cannot be added to obtain a total variance.

**Fig 5.4 Scree plot**



**Fig 5.5 Shows stress levels of different components**

Component Matrix <sup>a</sup>		
	Component	
	1	2
pss8	-.757	.379
pss10	.752	
pss3	.712	.303
pss2	.709	
pss5	-.650	.435
pss7	-.621	.334
pss6	.618	
pss4	-.615	.515
pss1	.580	.414
pss9	.558	.422

Extraction Method: Principal Component Analysis.

a. 2 components extracted.

**Final thoughts:** All of the objects in the component matrix load onto component 1, which has two components. As a result, we may say that there is just one construct for the perceived stress scale.

**Question6:** Is there any significant difference in total life satisfaction based on gender?

**Statistical Test:** We will use the **T-test** as a statistical tool for our study to determine how total life satisfaction, which is a continuous variable vs. categorical variable, differs for males and females. Levene's test in the independent samples test shows a significance of 0.401 which is  $> 0.05$  which shows Levene's test is insignificant.

**Fig 6.1 Significance shown in the independent sample test table**

Independent Samples Test										
		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
Total life satisfaction	Equal variances assumed	.706	.401	-1.881	434	.061	-1.230	.654	-2.516	.055
	Equal variances not assumed			-1.897	408.528	.059	-1.230	.648	-2.505	.044

From the group statistics, we can see that the mean value and standard deviation of females (M=22.90, SD=6.91) are more than males (M=21.67, SD=6.52) but there is no significant difference in life satisfaction.

**Final thoughts:** The t-test (434) = -1.881 and t(408.5) = -1.897 shows a significant value of 0.061 and 0.059 respectively which is  $> 0.05$  so it means there is no significant difference in total life satisfaction based on gender

**Fig 6.2 Mean and Standard deviation of Male and female**

Group Statistics					
	sex	N	Mean	Std. Deviation	Std. Error Mean
Total life satisfaction	MALES	185	21.67	6.525	.480
	FEMALES	251	22.90	6.911	.436

**Question7:** Will there be any significant differences in the total life satisfaction if the person is a smoker or not?

**Statistical Test:** Here we are analyzing total life satisfaction based on if a person smoke or not which is a categorical variable ( $\leq 2$  levels) vs a continuous variable. Hence, we will use the **T-test as a statistical tool** for our analysis.

In the independent sample test, Levene's test yields significance = 0.422, which is  $> 0.05$  and indicates that it is insignificant

**Fig 7.1 Levene's test shows the significance**

		Independent Samples Test								
		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
Total life satisfaction	Equal variances assumed	.646	.422	-1.252	431	.211	-1.028	.821	-2.641	.586
	Equal variances not assumed			-1.234	126.095	.219	-1.028	.833	-2.675	.620



**Fig 7.2 Shows the mean and standard deviation of total life satisfaction**

Group Statistics					
	smoker	N	Mean	Std. Deviation	Std. Error Mean
Total life satisfaction	YES	85	21.55	6.912	.750
	NO	348	22.58	6.754	.362

According to the group statistics, there is a considerable difference in the mean total life satisfaction between smokers (M=21.58, SD=6.91) and nonsmokers (M=22.58, SD=6.74). **Final thoughts:** Additionally, the t-significant test's  $t(431) = -1.252$  value is 0.211, which is greater than 0.05, demonstrating that the values are not significantly different.

**Question8:** How does total self-esteem differ based on different age groups?

**Statistical Test:** We are using **one-way ANOVA** as a statistical method for this research since there are numerous levels of a categorical independent variable (> 2 levels), where independent categorical variable, representing age groups, and a continuous dependent variable, representing self-esteem.

**Fig 8.1 Levene's significance**

Tests of Homogeneity of Variances					
		Levene Statistic	df1	df2	Sig.
Total Self esteem	Based on Mean	1.303	2	433	.273
	Based on Median	.975	2	433	.378
	Based on Median and with adjusted df	.975	2	432.870	.378
	Based on trimmed mean	1.444	2	433	.237

**Fig 8.2 ANOVA table shows significance < 0.05**

ANOVA					
Total Self esteem	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	258.075	2	129.038	4.505	.012
Within Groups	12402.475	433	28.643		
Total	12660.550	435			

The subjects are divided into 3 age groups: **GROUP1** contains people aged 29 and below, **GROUP2** contains people between the ages of 33 and 44, and finally, **GROUP3** contains people aged greater than 45. Levene's statistic is 0.237, which, as we can see across all the rows of mean and median, is not significant. Additionally, the ANOVA's  $F(2,435) = 4.50$  and significant value = 0.012 which is < 0.05 demonstrates that there are differences because the value is significant.

**Fig 8.3 Shows the mean and standard deviation of different age groups**

Descriptives									
Total Self esteem									
	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum	Between-Component Variance
18 - 29	149	32.60	5.589	.458	31.69	33.50	18	40	
30 - 44	152	33.59	5.288	.429	32.74	34.43	18	40	
45+	135	34.50	5.151	.443	33.63	35.38	20	40	
Total	436	33.53	5.395	.258	33.02	34.04	18	40	
Model	Fixed Effects		5.352	.256	33.03	34.04			
	Random Effects			.545	31.19	35.88			.692



The mean and standard deviation between the age groups don't differ much, therefore we will examine post hoc testing to determine where the difference is.

**Fig 8.4 shows Tukey's post hoc test**

Multiple Comparisons						
Dependent Variable: Total Self esteem						
Tukey HSD						
(I) age 3 groups	(J) age 3 groups	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
18 - 29	30 - 44	-.988	.617	.246	-2.44	.46
	45+	-1.906*	.636	.008	-3.40	-.41
30 - 44	18 - 29	.988	.617	.246	-.46	2.44
	45+	-.918	.633	.316	-2.41	.57
45+	18 - 29	1.906*	.636	.008	.41	3.40
	30 - 44	.918	.633	.316	-.57	2.41

\*. The mean difference is significant at the 0.05 level.

**Fig 8.5 Shows a measure of significant difference**

ANOVA Effect Sizes <sup>a,b</sup>				
Total Self esteem		Point Estimate	95% Confidence Interval	
			Lower	Upper
Total Self esteem	Eta-squared	.020	.001	.051
	Epsilon-squared	.016	-.004	.047
	Omega-squared Fixed-effect	.016	-.004	.046
	Omega-squared Random-effect	.008	-.002	.024

a. Eta-squared and Epsilon-squared are estimated based on the fixed-effect model.

b. Negative but less biased estimates are retained, not rounded to zero.

When you look at the values with \* in the mean difference column we can find the difference. There is a significant difference between GROUP1 (18-29 years) with M=32.60 and SD=5.586 and GROUP3 (45+ years) with M=34.50 and SD=5.15 where mean difference=1.906 and vice versa. But we can also see that GROUP2(33-44 years) doesn't have any significant difference with both group1 and group3. To measure how huge, the difference is we can analyze the ANOVA effect sizes and look at the eta squared. The point estimate=0.02 which means even though we have a significant difference based on the eta-squared value it's very minimum.

**Question9:** How do a person's marital status and smoking affect total life satisfaction and does a smoker moderate relationship between marital status and life satisfaction

**Statistical Test:** Here we have considered a dependent continuous variable total life satisfaction vs two independent categorical variables such as smoker and marital status with more than 2 levels. Hence, we are using **2-way ANOVA** as a statistical tool for this analysis.

**Fig 9.1 Shows Levene's significance value**

Levene's Test of Equality of Error Variances <sup>a,b</sup>					
		Levene Statistic	df1	df2	Sig.
Total life satisfaction	Based on Mean	.870	15	417	.599
	Based on Median	.705	15	417	.780
	Based on Median and with adjusted df	.705	15	403.584	.780
	Based on trimmed mean	.834	15	417	.639

Tests the null hypothesis that the error variance of the dependent variable is equal across groups.

a. Dependent variable: Total life satisfaction

b. Design: Intercept + marital + smoke + marital \* smoke

**Fig 9.2 Test between subjects shows interaction based on the significance**

Tests of Between-Subjects Effects						
Dependent Variable: Total life satisfaction						
Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	1670.412 <sup>a</sup>	15	111.361	2.545	.001	.084
Intercept	55483.192	1	55483.192	1268.067	.000	.753
marital	848.898	7	121.271	2.772	.008	.044
smoke	46.790	1	46.790	1.069	.302	.003
marital * smoke	155.529	7	22.218	.508	.829	.008
Error	18245.473	417	43.754			
Total	236766.000	433				
Corrected Total	19915.885	432				

a. R Squared = .084 (Adjusted R Squared = .051)

Levene's test has a value of 0.870 which proves it is insignificant and the tests of between-subjects effects will show if there is any interaction. The significance of marital status\*smoke F (7,433) =0.508 and p= 0.829 which is not significant hence we can move on to the main factors. Marital status F (7,433) =2.77 and p=0.008 which is significant and smoke F (1,433) =1.06 AND p=0.30 which is not significant. So, life satisfaction doesn't vary much based on whether the person is smoking or not. But surely there is a difference in life satisfaction based on marital status.

**Fig 9.3 Tukey post hoc test**

Dependent Variable: Total life satisfaction  
Tukey HSD

(I) marital status	(J) marital status	Mean Difference (I-J)
SINGLE	STEADY RELATIONSHIP	-1.55
	LIVING WITH PARTNER	-1.92
	MARRIED FIRST TIME	-2.56*
	REMARRIED	-3.91
	SEPARATED	5.13
	DIVORCED	1.87
	WIDOWED	-6.32
STEADY RELATIONSHIP	SINGLE	1.55
	LIVING WITH PARTNER	-.37
	MARRIED FIRST TIME	-1.01
	REMARRIED	-2.35
	SEPARATED	6.68
	DIVORCED	3.42
	WIDOWED	-4.76
LIVING WITH PARTNER	SINGLE	1.92
	STEADY RELATIONSHIP	.37
	MARRIED FIRST TIME	-.64
	REMARRIED	-1.98
	SEPARATED	7.05
	DIVORCED	3.79
	WIDOWED	-4.39
MARRIED FIRST TIME	SINGLE	2.56*
	STEADY RELATIONSHIP	1.01
	LIVING WITH PARTNER	.64
	REMARRIED	-1.35
	SEPARATED	7.69*
	DIVORCED	4.43
	WIDOWED	-3.76
REMARRIED	SINGLE	3.91
	STEADY RELATIONSHIP	2.35
	LIVING WITH PARTNER	1.98
	MARRIED FIRST TIME	1.35
	SEPARATED	9.03*
	DIVORCED	5.78*
	WIDOWED	-2.41
SEPARATED	SINGLE	-5.13
	STEADY RELATIONSHIP	-6.68
	LIVING WITH PARTNER	-7.05
	MARRIED FIRST TIME	-7.69*
	REMARRIED	-9.03*
	DIVORCED	-3.26
	WIDOWED	-11.44*
DIVORCED	SINGLE	-1.87
	STEADY RELATIONSHIP	-3.42
	LIVING WITH PARTNER	-3.79
	MARRIED FIRST TIME	-4.43
	REMARRIED	-5.78*
	SEPARATED	3.26
	WIDOWED	-8.19
WIDOWED	SINGLE	6.32
	STEADY RELATIONSHIP	4.76
	LIVING WITH PARTNER	4.39
	MARRIED FIRST TIME	3.76
	REMARRIED	2.41
	SEPARATED	11.44*
	DIVORCED	8.19

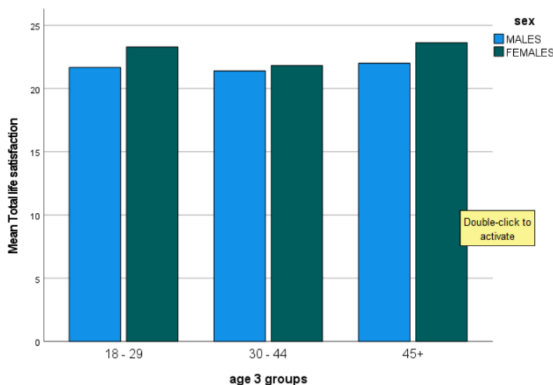
The Post-hoc test using Tukey's HSD shows the below,

1. There is a significant difference in Life satisfaction of **single** and **married first time** with a mean difference of 2.56 where single has M=20.83 & SD=6.721 and married for the first time has M=23.39 & SD = 6.78
2. There is a significant difference in Life satisfaction of **married first time** with **single** & **separated** with a mean difference of 2.56 and 7.69 respectively where separated has M=15.70 & SD=5.79
3. There is a significant difference in Life satisfaction of **remarried** with **separated** and **divorced** with a mean difference of 9.03 and 5.78 respectively where remarried has M=24.73 & SD=6.03 and divorced has M=18.96 & SD=6.93
4. There is a significant difference in Life satisfaction of **separated** with the **married first time**, **remarried**, **and widowed** with a mean difference of 7.69, 9.03, and 11.44 respectively where widowed has M=27.14 and SD=5.33.

We were able to see a difference in total life satisfaction for a few groups but not for many hence the total life satisfaction does not have any significant difference based on gender and marital status

**Question 10:** Present graphically how Total life satisfaction differs between age groups and gender.

**Statistical Test:** We are going to use a **Bar Chart** to show how total life satisfaction differs between each age group and gender.



The graph shows mean total life satisfaction of male and female between 3 age groups. We can see that females between ages 18-29 and 45+ have the highest life satisfaction. Whereas women between ages of 30-44 shows a slight decrease in total life satisfaction compared to the other 2 age groups. And the men between all the 3 age groups share almost the same number and there is no big difference in them.