Income and Happiness

Abstract

Are wealthier people happier? The research study employed simple linear regression analysis to confirm the positive relationship between income and happiness. The study obtained data from an existing dataset by selecting only 959 participants in New York City. The results indicated that there is a statistically significant positive relationship between income and happiness; however, the relationship is really weak, which is consistent with the previous research studies. Thus, the answer to the research question is “yes” people who have more money are happier than those who have less. As income is slightly related to happiness, future research should extensively focus on more independent variables in the study such as age, health, education and employment.

Introduction

Are wealthier people happier? This question has been widely asked among economists and socialists in this contemporary society. In general, people firmly believe that if they have more money, their life would be much better. Based on conventional economics, it is believed that money can buy happiness. It is because money can be used to exchange for things to satisfy people's needs. Likewise, a research study conducted by Schnittker (2008) found that the correlation between income and happiness is always understood in terms of income allowing people to enjoy their life and consume goods to fulfill their needs and increase their well-being. Therefore, money and happiness are highly linked, and usually it is believed that people with higher income are happier than people with lower income; in other words, people with lower income are less happy than people with higher income.

There have been extensive research related to the relationship between income and happiness. Most of the evidence indicates that there is a positive relationship between income and happiness (Schnittker, 2008). Higher incomes and greater happiness are highly linked. Schnittker (2008) believed that this positive relationship is not surprising, and people usually use socio-economic status as a key element to explain characteristics of quality of life. Based on Diener (1984) Wealthy people would describe their life as good, and tend to satisfy with their life much better than less wealthy people within a given society (as cited in Boyce, Brown, & Moore, 2010).

Therefore, the purpose of this research study is to confirm the positive bivariate relationship between income and happiness. In other words, it is to confirm if people who have more money are happier than those who have less money. The study aims to answer the research question: to what extent is income related to happiness? The null hypothesis (H_0) is "There is no statistically significant relationship between income and happiness”, while the alternative hypothesis (H_1) is “There is a statistically significant relationship between income and happiness”.

Literature Review

The relationship between income and happiness has been studied by many researchers, especially economists. According to Hernandez-Murillo (2010), Richard Easterlin was the first modern economist who investigated the association between income and happiness (as cited in Como, 2011). Easterlin has done extensive research regarding the income-happiness relationship. Through his investigations, Easterlin (2001) found three empirical regularities to explain his theory. Firstly, at a given time people with higher income are happier than those with less income. Secondly, over the life cycle, the level of happiness remains stable in spite of a growth in the level of income. Finally, people tend to believe that they were less happy in the past and happier in the future.

Easterlin (2001) observed the relationship between income and happiness. He found that in each representative national survey, a statistically significant positive bivariate relationship between income and happiness has always been found (Andrews, 1986, p. xi; Argyle, 1999, pp. 356-7; Diener, 1984, p.553 as cited in Easterlin, 2001). According to the General Social Survey (GSS) in the United States in 1994, a direct question regarding subjective well-being was used to measure happiness: “Taken all together, how would you say things are these days – would you say that you are very happy, pretty happy, or not too happy? (p. 466)”, and it was found that 16% of people in the lowest income category and 44% of people in the highest income one reported very happy (cited in Easterlin 2001). By computing the mean of the happiness rating on the scale “Very happy (4)”, “Pretty happy (2)”, and “Not to happy (0)”, Easterlin (2001) found that the average point of happiness varies according to the level income, ranging from a low point of 1.8 to a high point of 2.8. Therefore, even though it has been proved that there is a positive relationship between income and happiness, the relationship between the two variables is often weak (Howell & Howell, 2008 cited in Boyce et al, 2010; Easterlin, 2001). This would mean wealthier people are happier, but not very much than less wealthy people at a point in time.

Easterlin (2001) further explained his second principle based on the life cycle principle. He stated that previous research’s findings were inconsistent regarding the age-happiness relationship. A study conducted by Mroczek and Kolarz (1998) found a positive relationship between age and happiness, whereas Myers (1992) found no correlation at all (cited in Easterlin, 2001). A survey conducted by George (1992) found that prior to 1970s older people in the United States were less happy than younger people, while the recent research studies found differently that older generation is happier than younger generation (cited in Easterlin, 2001). Easterlin (2001) explained that such inconsistency caused by the failure to take into account the plausibility of variation in the relationship over time. According to Easterlin (2001), stability of happiness in life cycle does not mean that the level of subjective well-being remains constant over the life time. McLanahan and Sorensen (1985), and Myers (1992) stated that significant changes of particular circumstances in life cycle such as unemployment, retirement, and death of family members affect subjective well-being of people (cited in Easterlin, 2001).

Easterlin (2001) continued to explain the last empirical regularity which is the past and prospective happiness. Based on the observation of life cycle happiness, there is a little change between people’s past and prospective happiness (Easterlin, 2001). In every survey, participants, however, generally think at any particular point in the life cycle they are happier today than in the past, and they will be happier in the future than today (Easterlin, 2001). The periods between past, today and future are long intervals such as 5 years or more. However, based on Easterlin (2001), in fact, on average the level of present happiness remains constant. Level of happiness does not change within a given period of time, but it is people who think they are becoming happier and happier from present time to the future.

Methods

Data collection

The data for this proposed study were obtained from an empirical study on Inter-university Consortium for Political and Social Research (ICPSR) website. The method of data collection was computer-assisted telephone interview (CATI). The data collection date was from May to November 2006. The original researcher, Lee (2006) conducted the survey on Assessing happiness and competitiveness of world major metropolises in ten major cities: Beijing, Berlin, London, Milan, New York city, Paris, Seoul, Stockholm, Tokyo, and Toronto. However, this proposed study selected only participants in New York City.

Participants

Participants were selected by using representative random sampling method. The participants were 18 years old and over living in New York City. There were 959 participants in the study. The descriptive statistics showed that there were 457 females and 502 males which were equal to 47.7% and 52.3% respectively (see Appendix A). Participants' ages ranged from 18 to 93. Mostly, participants were in middle adulthood, 40 years old of age, and on average, they were 44 years old (see Appendix A).

The target population for the research study is people in the United States, so the findings will be used to generalize people in the whole country. Accessible population in the study is people who are living New York City.

Variables and instrumentations

Independent variable in the proposed study was income. Income was used as a factor (independent variable) to predict happiness which was the dependent variable. Both income and happiness were interval level data. The two variables were developed based a five-point Likert scale. Income variable's scale consisted of "Very low income (1)", "Low income (2)", "Middle income (3)", "High income (4)" and "Very high income (5)". For happiness variable, the scale was originally developed by "Very happy (1)", "Somewhat happy (2)", "Neither happy nor unhappy (3)", "Not very happy (4)", and "Not happy at all (5)". The happiness's scale was inconsistent with the income's scale because usually the more positive things should get higher points. Therefore, the happiness's scale was reversed to "Not happy at all (1)", "Not very happy (2)", "Neither happy nor unhappy (3)", "Somewhat happy (4)", and "Very happy (5)".

Analytical approach

To control for type II error rate, statistical power has to be at least 0.80, and to achieve this statistical power value, 41 participants were needed. The calculation was done by using Power syntax for bivariate correlation on the course website (see Appendix D). The number of participants in the study was 959, so the power value of 0.80 was satisfied.

To be able to answer the research question, simple linear regression was employed to examine if income can be a predictor of happiness. The research study used Statistical Package for the Social Sciences (SPSS) program to run simple linear regression. In order to be able to run simple linear regression, the data obtained have to fulfill 6 basic assumptions:

1. Random sampling
2. Normality (Error in the dependent variable is normally distributed)

3. Homoscedasticity (The error is constant for all values of X, example constant variance)
4. Linearity (Linear relationship exists between X and Y)
5. Independence of Errors (Error in the dependent is assumed to be uncorrelated and independent from one another and also X)
6. Variables are measured without error (Example, Outlier)

To test if the above assumptions met, some descriptive statistics were run such as mean, standard deviation, skewness, kurtosis, normal Q-Q plots and histograms of dependent variable error, test of normality – Kolmogorov-Smirnov and Shapiro-Wilk, and test of homogeneity of variance – Levene statistic.

Moreover, some inferential statistics were used in the research study to measure the relationship between independent and dependent variables. Cook's distance and Durbin-Watson were used to test if outliers have leverage on the model, and if errors are correlated respectively. Pear's r correlation was run to test if income and happiness were related, and the effect size was tested to measure the proportion of variation in dependent variable. Power was run to control type II error rate and to see its percentage of achieving statistical significance. The standard error of estimate (SEE) was measured to show the error term in the unit of analysis in the model. If $r_{observed} > r_{critical}$, we can reject the null hypothesis and accept the alternative hypothesis, which means there is a relationship between income and happiness, while we fail to reject the null if $r_{observed} \leq r_{critical}$.

Furthermore, one-way ANOVA was run to see if regression explains a significant proportion of the variation in dependent variable. If $F_{observed} \leq F_{critical}$, the regression does not explain a significant proportion of the variation in dependent variable, whereas the regression does explain a significant proportion of the variation in dependent variable if $F_{observed} > F_{critical}$.

Finally, t-tests for the population slope and population intercept were also conducted. The t-test for the population slope was used to measure the linear relationship between income and happiness. If $t_{observed} > t_{critical}$, we can reject the null hypothesis, and accept the alternative hypothesis, and there is statistical evidence to prove that there is a linear relationship between income and happiness ($\beta \neq 0$). However, if $t_{observed} \leq t_{critical}$, we have to fail to reject the null hypothesis, and there is no linear relationship between income and happiness. In addition, the t-test for population intercept was conducted to test if the starting point is 0. If $t_{observed\ intercept} > t_{critical}$, we can reject the null hypothesis, and accept the alternative hypothesis, which means there is statistical evidence to prove that the starting point is not 0 ($\alpha \neq 0$). However, if $t_{observed\ intercept} \leq t_{critical}$, we have to fail to reject the null hypothesis, and a conclusion can be drawn that the starting point is 0. All of the tests were measured at 0.05 alpha level.

Findings

The data were fine for simple linear regression test because they fulfilled the 6 assumptions. For the first assumption, Lee (2006) used representative random sampling to select participants. Therefore, the data were fine for the first assumption. Based on the test of normality – Kolmogorov-Smirnov and Shapiro-Wilk, the results showed that $P_{value} < \alpha$; however, because the histogram indicated that errors in the dependent variable are normally distributed (see Appendix B), and the kurtosis (1.576) and skewness (-1.248) were within the range of -2 and +2. Also, mean 4.19 was bigger than standard deviation 0.877. To sum up, we could assume that the errors in dependent variable were normally distributed. For the third assumption, the test of homogeneity of variance was checked via the Levene statistic. The null hypothesis for the

Levene statistic test was "The variances are equal", and the alternative hypothesis was "The variances are not equal". The results indicated that based on mean, P_{value} (0.311) > α (see Appendix C), so we failed to reject the null hypothesis, which means variances in the model were assumed equal. Hence, the third assumption was satisfied. For the fourth assumption, the t-test for the population slope was used to measure the linear relationship between income and happiness. The hull hypothesis for the slope was "There is no linear relationship between income and happiness (β=0)", and the alternative hypothesis was "There is a linear relationship between income and happiness (β≠0)". The results in the Coefficients table (see Appendix H) indicated that $t_{observed\ slope}$ value was 6.295, and $P_{value} < \alpha$ (0.05). At 0.05 alpha level, degree of freedom of 957, and a two-tailed test, the $t_{critical}$ value was around 1.96. According to the results, $t_{observed\ slope} > t_{critical}$, we rejected the null hypothesis, and accepted the alternative hypothesis. There was statistical evidence to prove that there was a linear relationship between income and happiness (β≠0). As a result, the fourth assumption was fulfilled. Based on Model summary (see Appendix E), the Durbin Watson's value was 1.848 (between 1.5 and 2.5), which means the error terms from the dependent variable appeared to be uncorrelated and independent from one another. So, the fifth assumption was satisfied. Based on the boxplot (see Appendix I), the model has 14 outliers; however, the Cook's distance statistic maximum value was 0.037 (see Appendix H), which was below 1, so none of the outliers had leverage on the coefficients in the model. Therefore, the sixth assumption was fulfilled. The results showed that all of the assumptions for the simple linear regression test for the model were fulfilled.

The Pear's r correction test results showed that $r_{observed}$ value is 0.199 significant at 0.01 alpha level (2 tailed), meaning there was a positive, slight correlation between income and happiness (see Appendix D). The Power value which was run on the Matrix was approximate 1, indicating that there was a 99% probability of achieving statistically significant results (see Appendix F). The adjusted R^2 value was 0.039, indicating a small effect size which means 3.9% of the variance in someone's happiness was accounted for by his income. The coefficient of non-determination value for these data ($1-r^2$) is 0.961, indicating 96.1% of the variance in someone's happiness was not accounted for by his income. The null hypothesis for Pear's r correlation was "There is no relationship between income and happiness ($p=0$)", and the alternative hypothesis was "There is a relationship between income and happiness ($p\neq0$)". At 0.05 alpha level, degree of freedom of 957, and a two-tailed test, the $r_{critical}$ value was approximately 0.195. With $P_{value} < \alpha$, and $r_{critical} < r_{observed}$, we rejected the null hypothesis, and accepted the alternative hypothesis. Hence, there was a statistically significant (positive, slight) correlation between income and happiness. Additionally, according to the Model summary table, the standard error of the estimate (SEE) value was 0.86 (see Appendix E). This value was the error term in the unit of analysis in the model.

For the one-way ANOVA test, the $F_{observed}$ value was 39.627 (see Appendix G). The null hypothesis was "Regression does not explain a significant proportion of the variation in dependent variable ($F_{observed} \leq F_{critical}$)", whereas the alternative hypothesis was "Regression does explain a significant proportion of the variation in dependent variable ($F_{observed} > F_{critical}$)". At 0.05 alpha level, degree of freedom numerator of 1, degree of freedom denominator of 957, and a two-tailed test, the $F_{critical}$ value was approximately 3.85. The results showed that $F_{observed}(39.627) > F_{critical}(3.85)$ and $P_{value} < \alpha$. Therefore, $F_{observed}$ was beyond the critical boundary of $F_{critical}$. As a result, we rejected the null hypothesis, and accepted the alternative hypothesis. We can come to a conclusion that the regression does explain a significant proportion of the variation in dependent variable.

The hypotheses for the y-intercept were that the null hypothesis was “The starting point is 0 ($\alpha=0$)”, and the alternative hypothesis was “The starting point is not 0 ($\alpha\neq0$)”. The t-test results for the y-intercept showed that $t_{observed\ intercept}$ value was 34.601 and $P_{value} < \alpha$ (0.05) (see Appendix H). The same to the population slope, at 0.05 alpha level, degree of freedom of 957, and a two-tailed test, the $t_{critical}$ value was approximately 1.96. The results were $t_{observed\ intercept} > t_{critical}$, and we rejected the null hypothesis, and accepted the alternative hypothesis. In conclusion, there was statistical evidence to prove that the starting point was not 0 ($\alpha\neq0$).

At 95% confidence intervals, the slope had a lower bound value of 0.141 and an upper bound value of 0.27, and the y-intercept had a lower bound value of 3.365, and an upper bound value of 3.769 (see Appendix H). Both of the slope’s and the y-intercept’s intervals did not contain 0; therefore, we rejected the null hypothesis, and accepted the alternative hypothesis. We are confident that out of 100 trials, 95 would contain the population mean y-intercept and the population mean slope in these intervals (estimated as 3.567 and 0.206).

The simple linear regression model is $\hat{Y} = a + bx + E$. “$\hat{Y}$” is the dependent variable which is happiness. “x” is the independent variable income which is used to predict $\hat{Y}$. “a” is y-intercept which is a constant term. “b” is the slope. Lastly, “E” is the random error term in the model. According to the Coefficients table, we had slope value (b) = 0.206, and y-intercept value (a) = 3.567, and error term value (E) = 0.86. Together, we got the simple linear regression model: $\hat{Y} = 3.567 + 0.206x + 0.86$.

Discussion

In conclusion, the results show that there is a statistically significant positive relationship between income and happiness; however, the relationship is really weak, which is consistent with the previous research studies (Howell & Howell, 2008 as cited in Boyce et al, 2010; Easterlin, 2001). Therefore, people with higher income are slightly happier than those who have less. In other words, people with less income are slightly less happy than those who have more. The study confirms Easterlin’s theory that over life time, happiness tends to remain stable in spite of income growth. People will not be much happier despite the fact that they have more money in the future. A main implication from this findings is that having more money does not make people much happier.

The study also shows that there is statistical evidence to prove that there is a linear relationship between income and happiness, and the starting point is not 0. For each increase of 1 point in income level, the model predicts that the expected level of happiness is estimated to increase by 0.206 or 1/5 of a happiness point, with the starting happiness level for the sample of 3.567 scale points. Based on these results, it can be concluded that income is not a good predictor of happiness.

There is a threat to internal validity regarding the instrumentation of the study. The word “happiness” is a construct. It is hard for participants to rate how happy they are directly. Instead, there should be operational definitions for the term happiness so that participants find it easier to answer the question. Additionally, income variable was developed by using interval measurement, which means participants were requested to rate their level of income in five different levels: very low income, low income, middle income, high income, or very high income. It is challenging for participants to rate their levels of income. The participants may not be sure of which levels they are in. It also depends on to whom participants compare their income. If they compare their income to very rich people, then they would rate their income low or even very low. In contrast, if they compare their income to very poor people, they would rate high or very high income. Hence, the instrument would be more accurate and valid if the participants are asked to tell their exact income.

The limitation of the study is that it can only prove the correlation between income and happiness, but not causation. The research study cannot tell if income is the cause of happiness. Furthermore, as income is slightly related to happiness, future research should extensively focus on more independent variables in the study such as age, health, education and employment.

References

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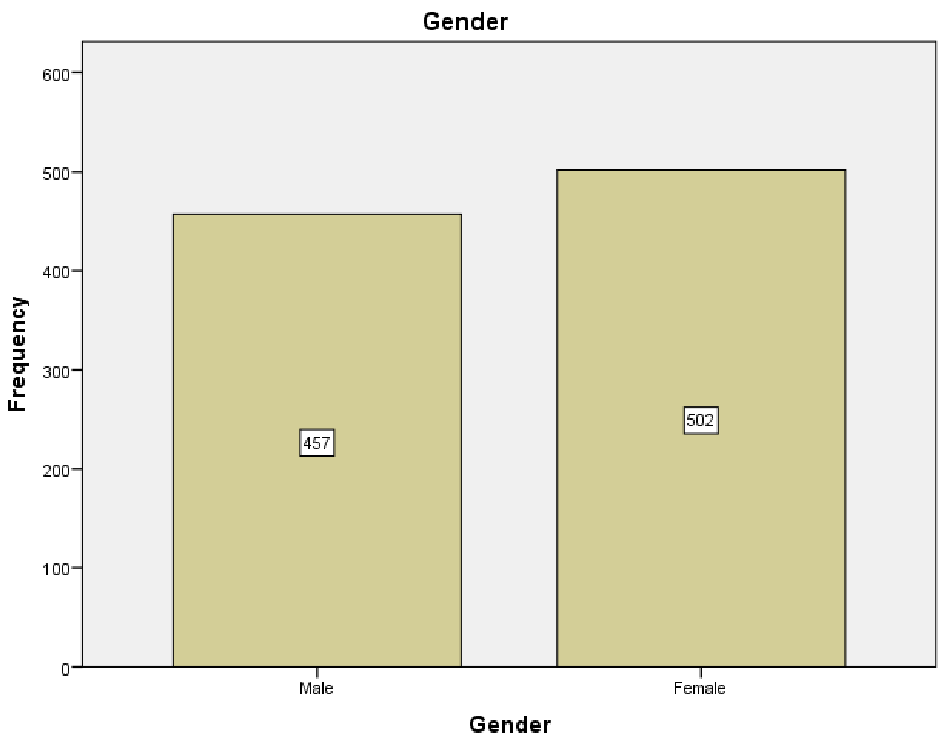
Appendices

Appendix A: Gender, age, income and happiness

Gender

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Male	457	47.7	47.7	47.7
	Female	502	52.3	52.3	100.0
	Total	959	100.0	100.0	



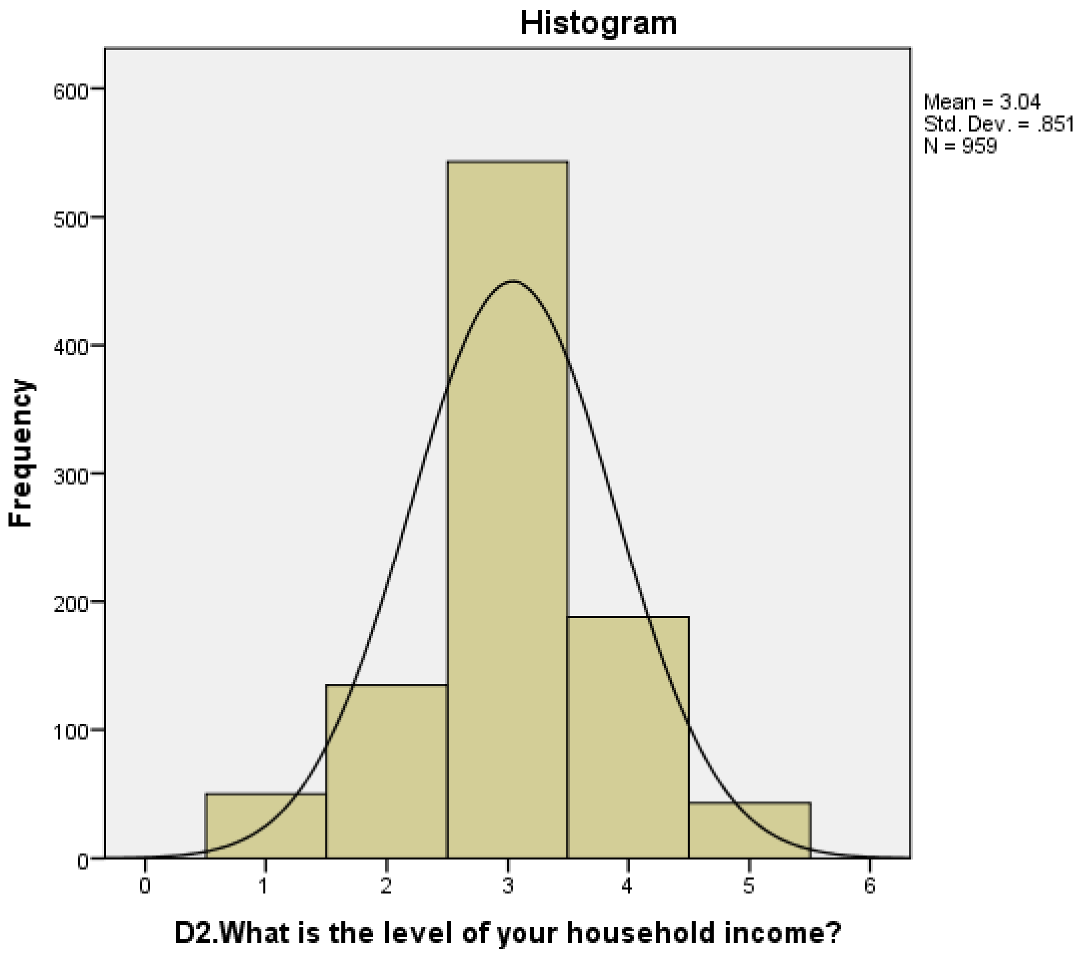
Statistics

Could you please tell me your age?

N	Valid	959
	Missing	0
Mean		44.25
Median		42.00
Mode		40
Std. Deviation		16.502
Skewness		.562
Std. Error of Skewness		.079
Kurtosis		-.340
Std. Error of Kurtosis		.158
Minimum		18
Maximum		93

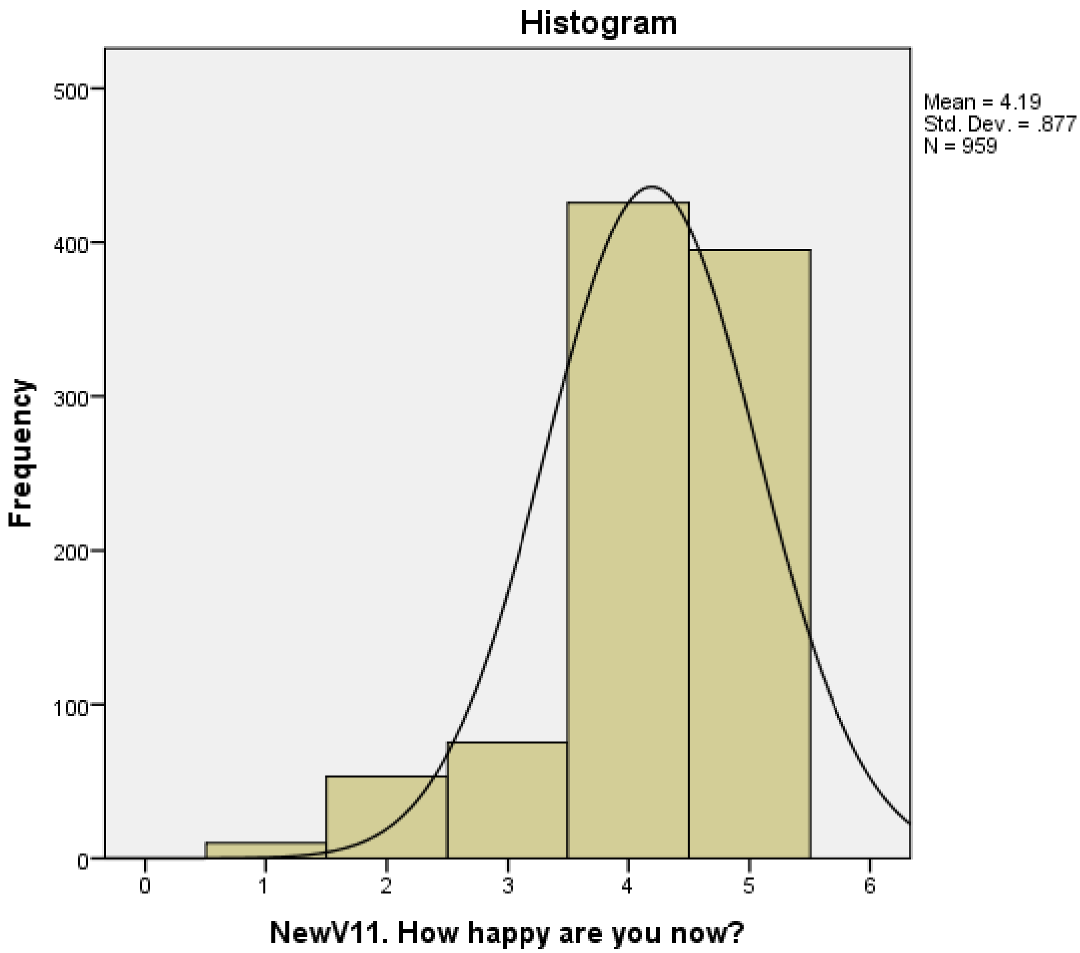
D2.What is the level of your household income?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very low income	50	5.2	5.2	5.2
	Low income	135	14.1	14.1	19.3
	Middle income	543	56.6	56.6	75.9
	High income	188	19.6	19.6	95.5
	Very high income	43	4.5	4.5	100.0
	Total	959	100.0	100.0	

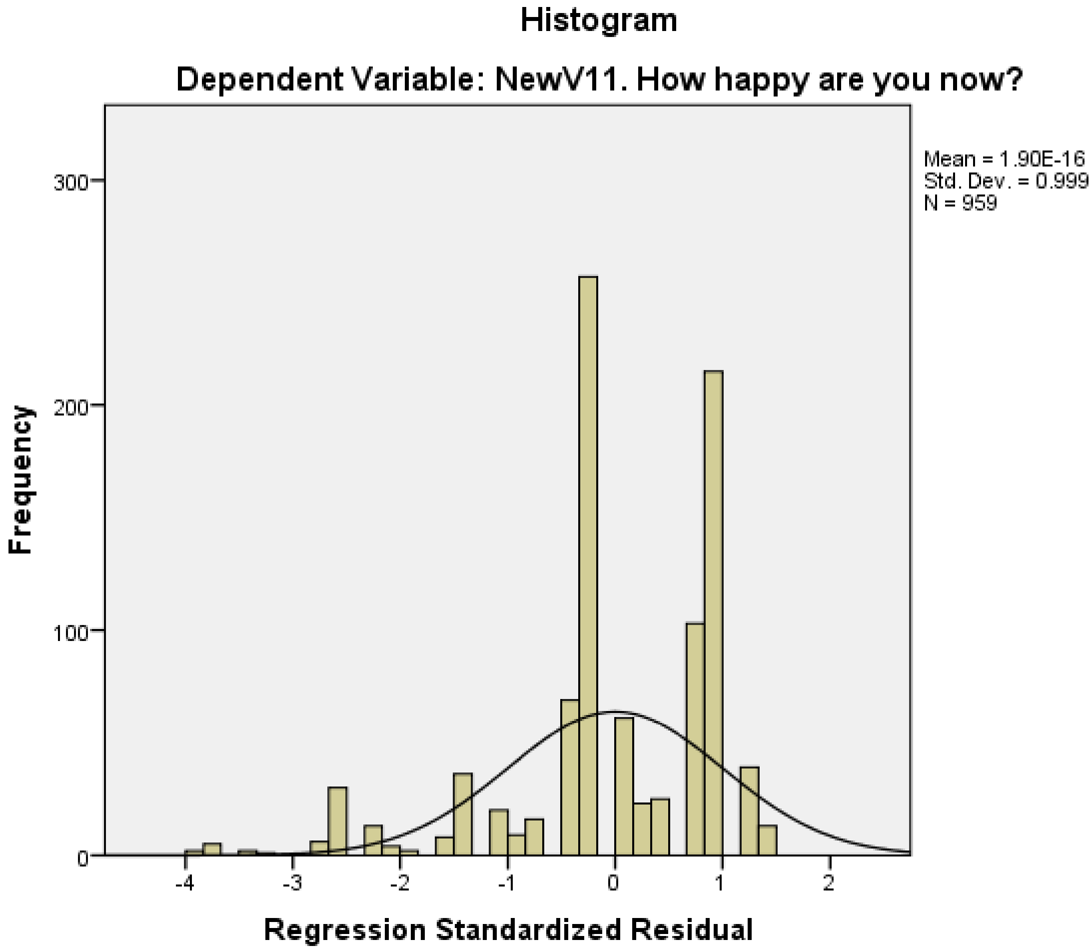


NewV11. How happy are you now?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Not happy at all	10	1.0	1.0	1.0
	Not very happy	53	5.5	5.5	6.6
	Neither happy nor unhappy	75	7.8	7.8	14.4
	Somewhat happy	426	44.4	44.4	58.8
	Very happy	395	41.2	41.2	100.0
	Total	959	100.0	100.0	


Histogram
Mean = 4.19
Std. Dev. = .877
N = 959
Frequency
0
100
200
300
400
500
0
1
2
3
4
5
6
NewV11. How happy are you now?

Appendix B: Test of normality



Statistics

NewV11. How happy are you now?

N	Valid	959
	Missing	0
Mean		4.19
Median		4.00
Mode		4
Std. Deviation		.877
Variance		.769
Skewness		-1.248
Std. Error of Skewness		.079
Kurtosis		1.576
Std. Error of Kurtosis		.158

Tests of Normality

	D2.What is the level of your household income?	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
		Statistic	df	Sig.	Statistic	df	Sig.
NewV11. How happy are you now?	Very low income	.277	50	.000	.854	50	.000
	Low income	.280	135	.000	.842	135	.000
	Middle income	.281	543	.000	.768	543	.000
	High income	.316	188	.000	.697	188	.000
	Very high income	.366	43	.000	.700	43	.000

a. Lilliefors Significance Correction

Appendix C: Test of homogeneity of variance

Test of Homogeneity of Variance

		Levene Statistic	df1	df2	Sig.
NewV11. How happy are you now?	Based on Mean	1.197	4	954	.311
	Based on Median	.896	4	954	.466
	Based on Median and with adjusted df	.896	4	914.734	.466
	Based on trimmed mean	.770	4	954	.545

Appendix D: Correlations

Correlations

		NewV11. How happy are you now?	D2.What is the level of your household income?
NewV11. How happy are you now?	Pearson Correlation	1	.199**
	Sig. (2-tailed)		.000
	N	959	959
D2.What is the level of your household income?	Pearson Correlation	.199**	1
	Sig. (2-tailed)	.000	

N	959	959

**. Correlation is significant at the 0.01 level (2-tailed).

Appendix E: Model summary

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.199[a]	.040	.039	.860	1.848

a. Predictors: (Constant), D2.What is the level of your household income?

b. Dependent Variable: NewV11. How happy are you now?

Appendix F: Sample size and Power

```
MATRIX.

*********************************************************************
Put your r value below and that is all
*********************************************************************.

COMPUTE r= 0.199.       /* Correlation between pairs *.
COMPUTE F0= 1.          /* Null hypothesis value *.
COMPUTE F1= 2.          /* Alternate hypothesis *.
COMPUTE Zalfa= 1.95996. /* Replace by  2.57583 if 1% sig. level is wanted *.
COMPUTE Zbeta=-0.84162. /* Replace by -1.28155 if 90% power is wanted *.
COMPUTE n=2+TRUNC(4*(1-r**2)*((Zalfa*SQRT(F0)-Zbeta*SQRT(F1))**2)/(F1-
F0)**2).
PRINT {n+1}
 /FORMAT='F8'
 /TITLE='THE MINIMUM SAMPLE SIZE NEEDED IS:'.
END MATRIX.

Run MATRIX procedure:

THE MINIMUM SAMPLE SIZE NEEDED IS:
       41

------ END MATRIX -----

COMPUTE n=959.           /* Sample size *.
COMPUTE r=0.199.       /* Correlation between pairs *.
COMPUTE F0=1.           /* Null hypothesis value *.
COMPUTE F1=2.           /* Ratio worth detecting *.
COMPUTE Zalfa= 1.95996. /* Replace by  2.57583 if 1% sig. level is wanted *.
COMPUTE Zbeta=Zalfa*SQRT(F0/F1)-0.5*(F1-F0)*SQRT((n-2)/(F1*(1-r**2))).
COMPUTE power=(1-CDFNORM(zbeta)).
PRINT power
 /FORMAT='F8.2'
 /TITLE='THE OBSERVED POWER OF YOUR TEST IS:'.
END MATRIX.

Run MATRIX procedure:
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THE OBSERVED POWER OF YOUR TEST IS:
     1.00
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Appendix G: ANOVA

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	29.292	1	29.292	39.627	.000[b]
	Residual	707.405	957	.739		
	Total	736.697	958			

a. Dependent Variable: NewV11. How happy are you now?

b. Predictors: (Constant), D2.What is the level of your household income?

Appendix H: Coefficients and residuals statistics

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95.0% Confidence Interval for B	
		B	Std. Error	Beta			Lower Bound	Upper Bound
1	(Constant)	3.567	.103		34.601	.000	3.365	3.769
	D2.What is the level of your household income?	.206	.033	.199	6.295	.000	.141	.270

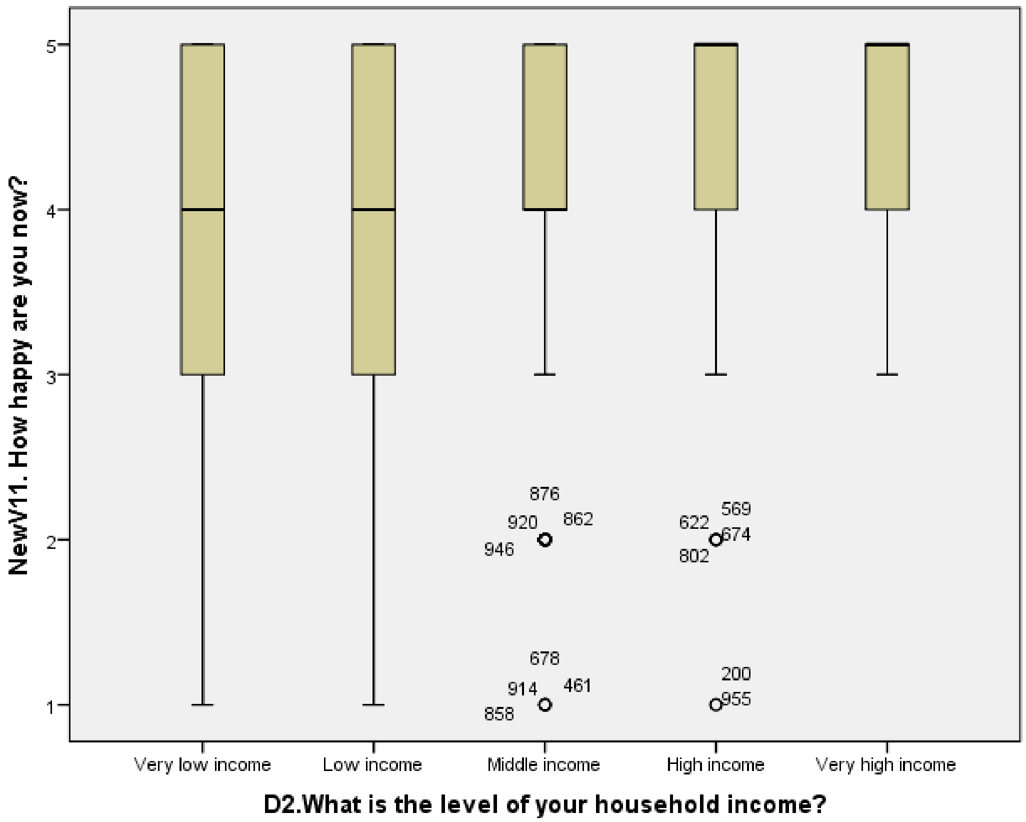
a. Dependent Variable: NewV11. How happy are you now?

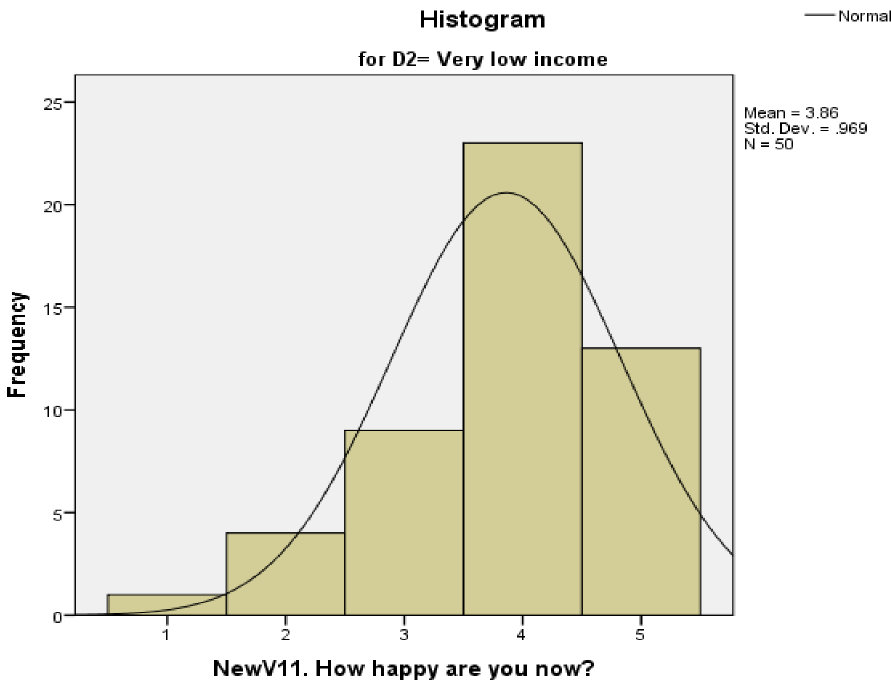
Residuals Statistics[a]

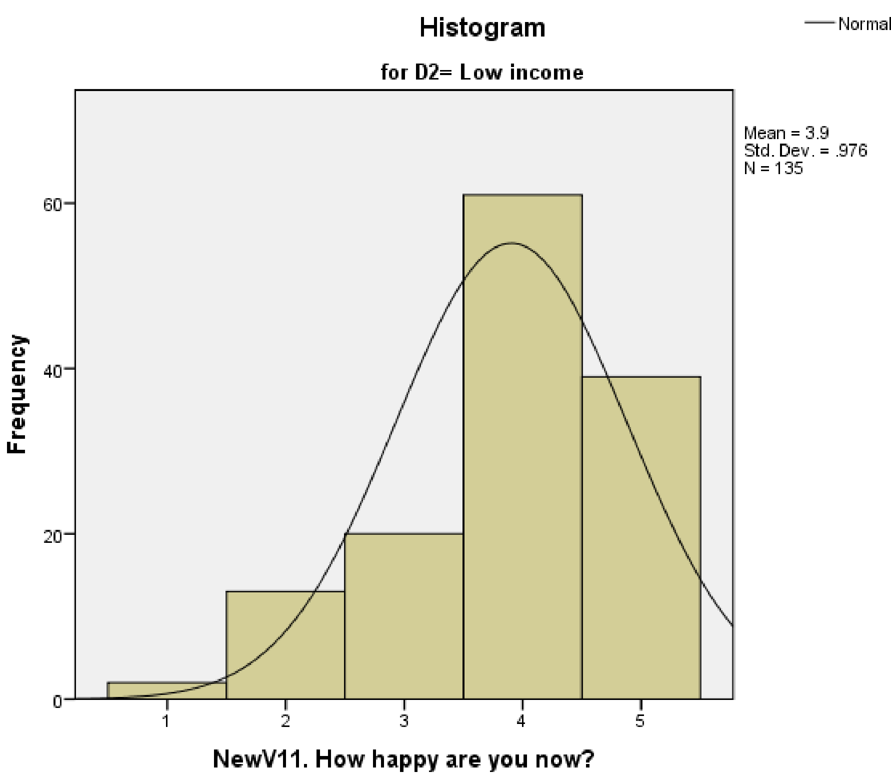
	Minimum	Maximum	Mean	Std. Deviation	N
Predicted Value	3.77	4.59	4.19	.175	959
Std. Predicted Value	-2.399	2.303	.000	1.000	959
Standard Error of Predicted Value	.028	.072	.037	.013	959
Adjusted Predicted Value	3.76	4.61	4.19	.175	959
Residual	-3.389	1.228	.000	.859	959
Std. Residual	-3.942	1.428	.000	.999	959
Stud. Residual	-3.947	1.433	.000	1.001	959
Deleted Residual	-3.397	1.236	.000	.861	959
Stud. Deleted Residual	-3.977	1.434	-.001	1.002	959
Mahal. Distance	.002	5.753	.999	1.620	959
Cook's Distance	.000	.037	.001	.002	959
Centered Leverage Value	.000	.006	.001	.002	959

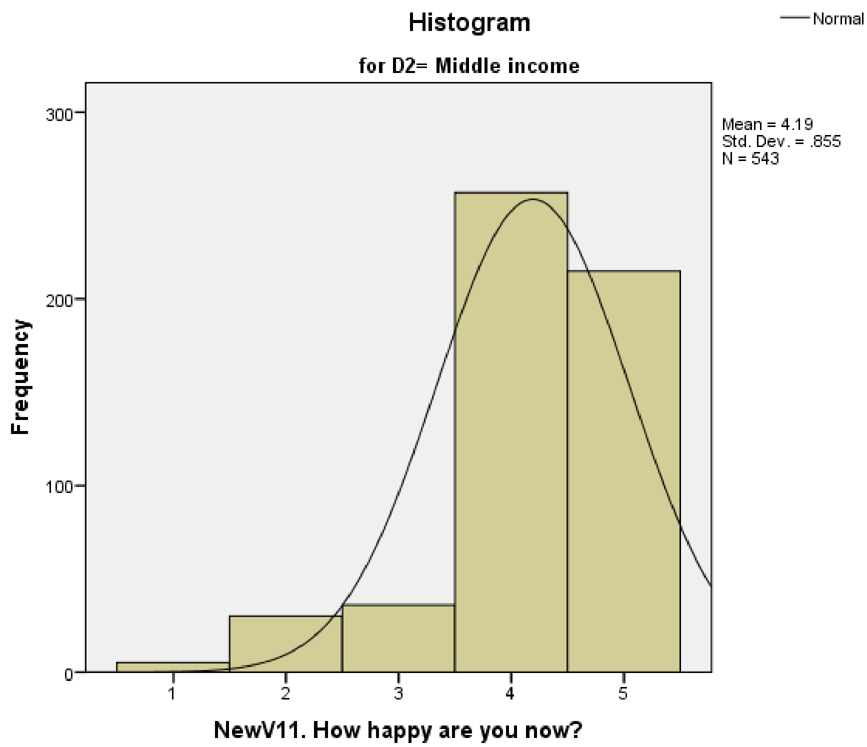
a. Dependent Variable: NewV11. How happy are you now?

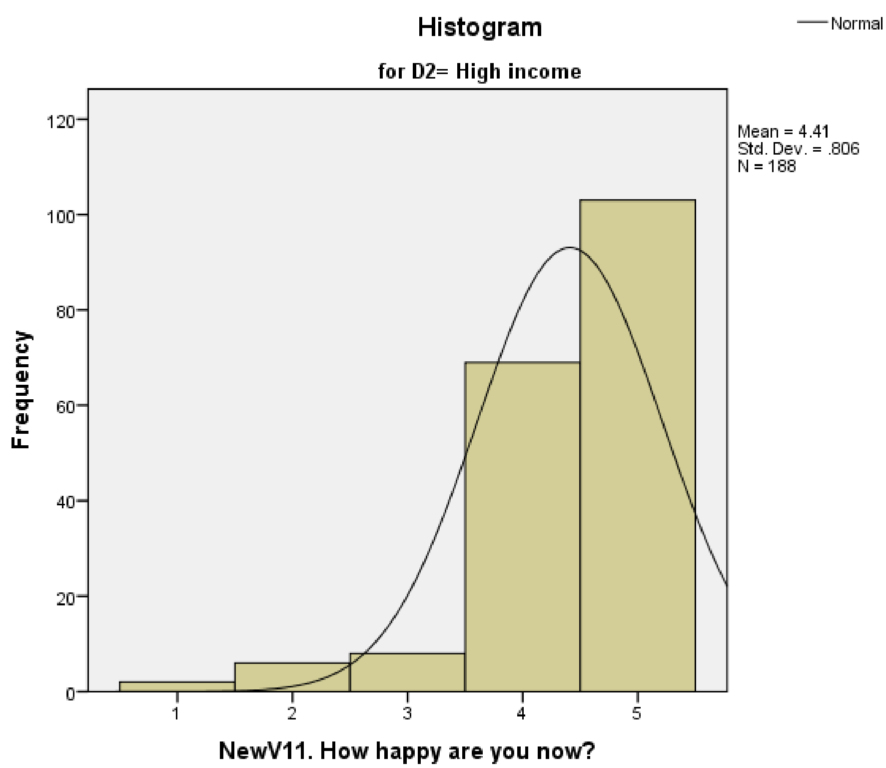
Appendix I: Boxplots, histograms, and normal Q-Q plots

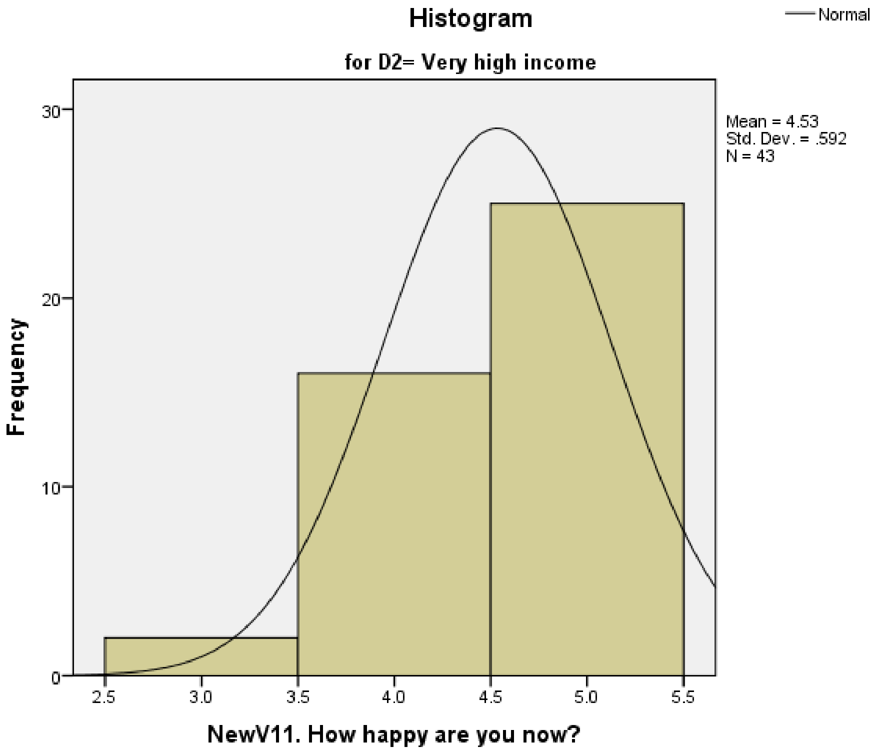


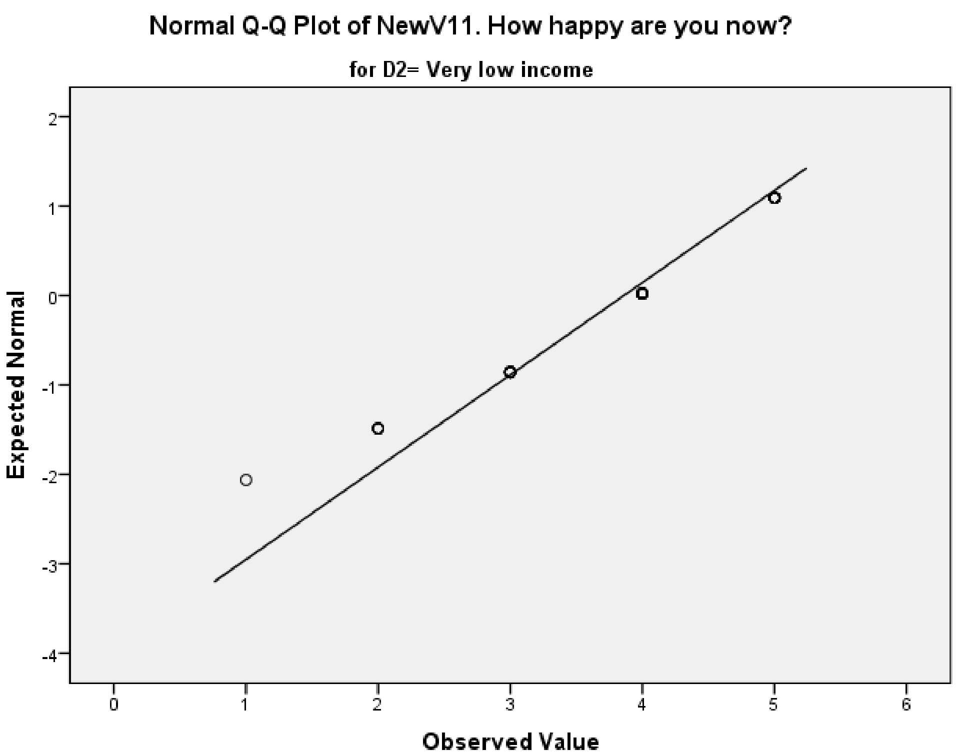

Histogram
for D2= Very low income
Normal
Mean = 3.86
Std. Dev. = .969
N = 50
Frequency
0
5
10
15
20
25
1
2
3
4
5
NewV11. How happy are you now?

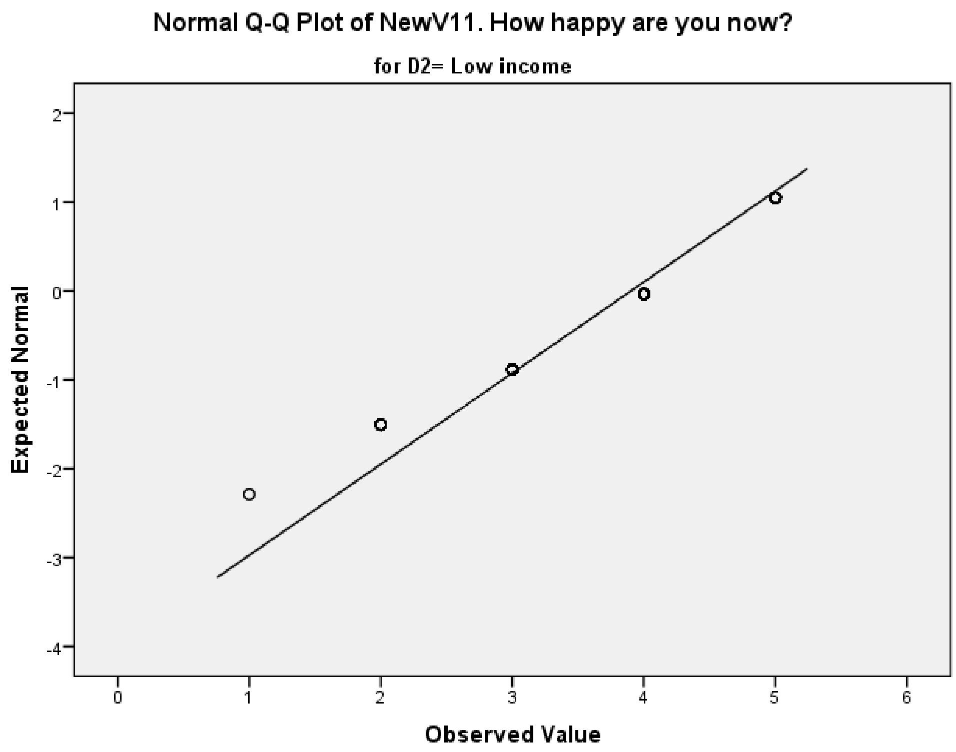

Histogram
for D2= Low income
Normal
Mean = 3.9
Std. Dev. = .976
N = 135
Frequency
0
20
40
60
1
2
3
4
5
NewV11. How happy are you now?

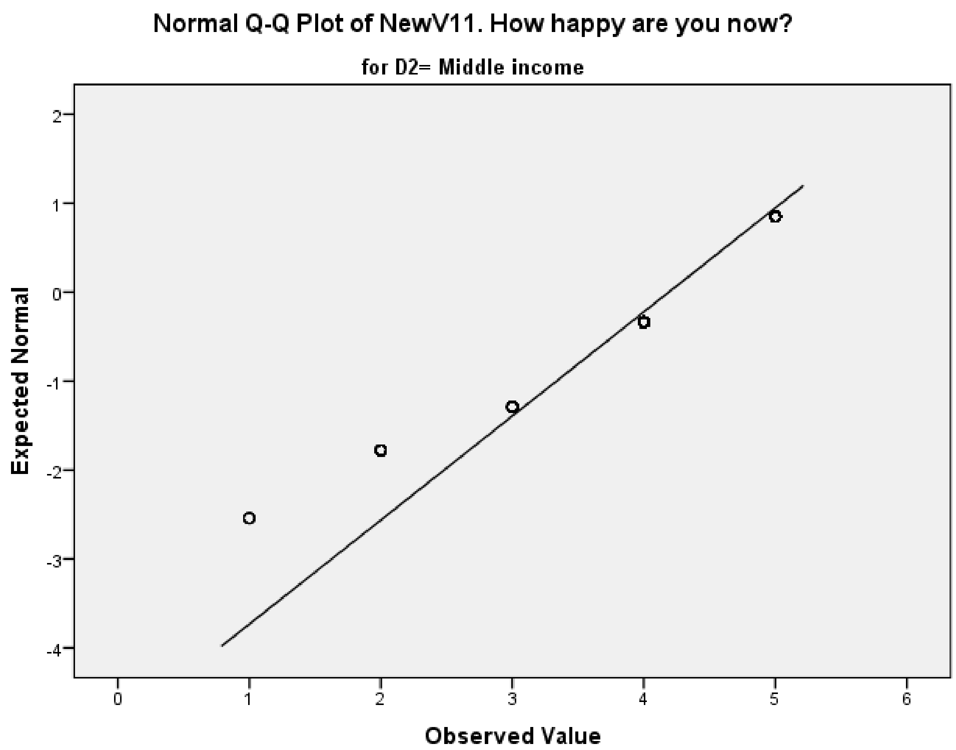

Histogram
for D2= Middle income
Normal
Mean = 4.19
Std. Dev. = .855
N = 543
Frequency
300
200
100
0
1
2
3
4
5
NewV11. How happy are you now?

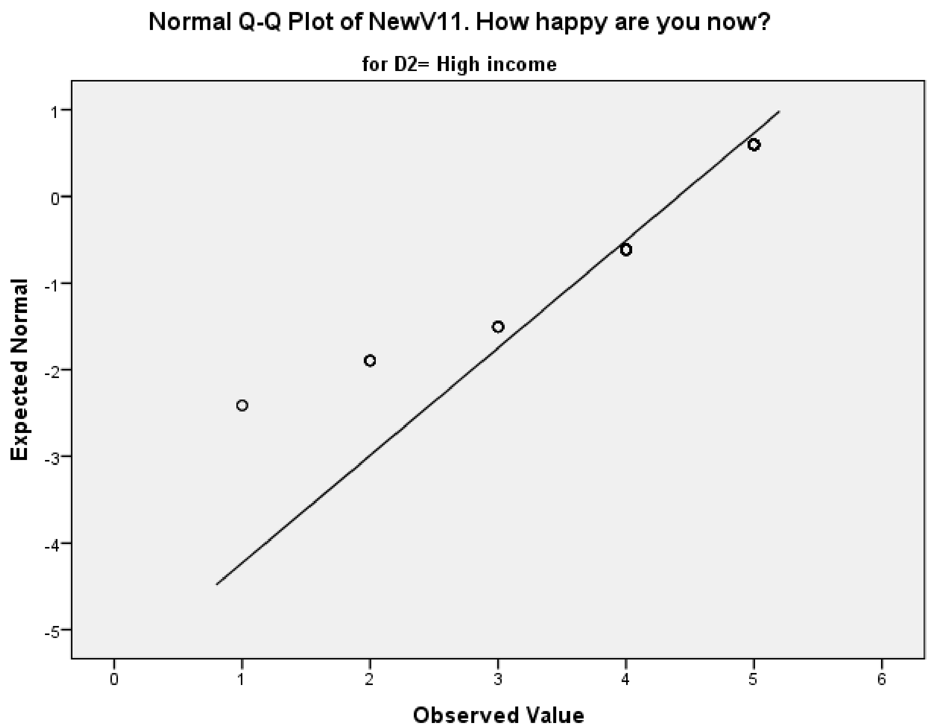

Histogram
for D2= High income
Normal
Mean = 4.41
Std. Dev. = .806
N = 188
Frequency
120
100
80
60
40
20
0
1
2
3
4
5
NewV11. How happy are you now?

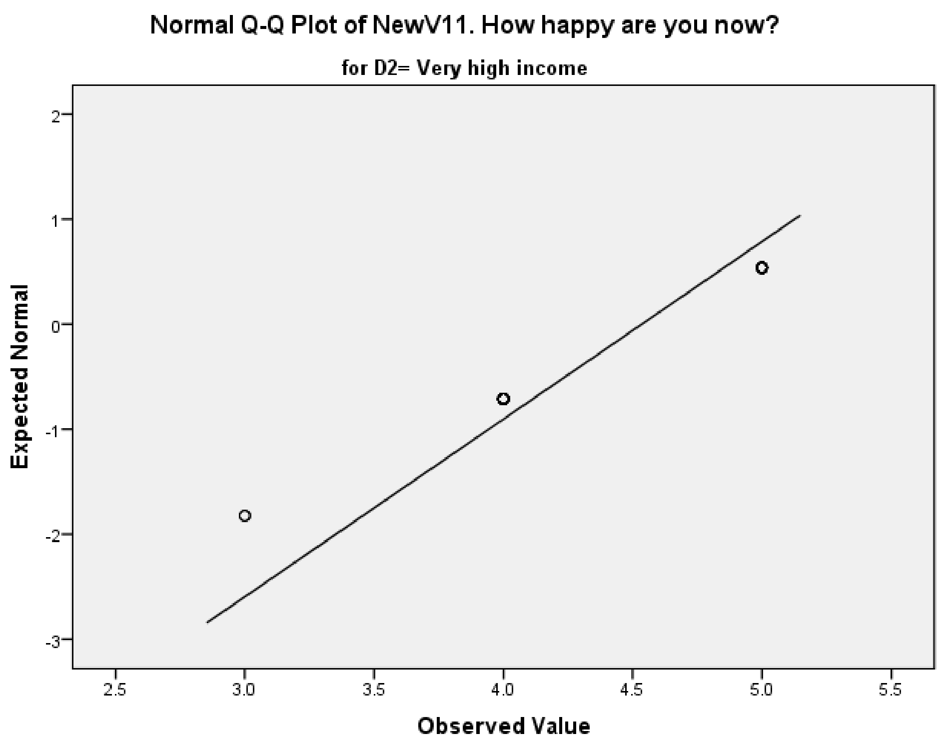

Histogram
for D2= Very high income
Normal
Mean = 4.53
Std. Dev. = .592
N = 43
Frequency
30
20
10
0
2.5
3.0
3.5
4.0
4.5
5.0
5.5
NewV11. How happy are you now?

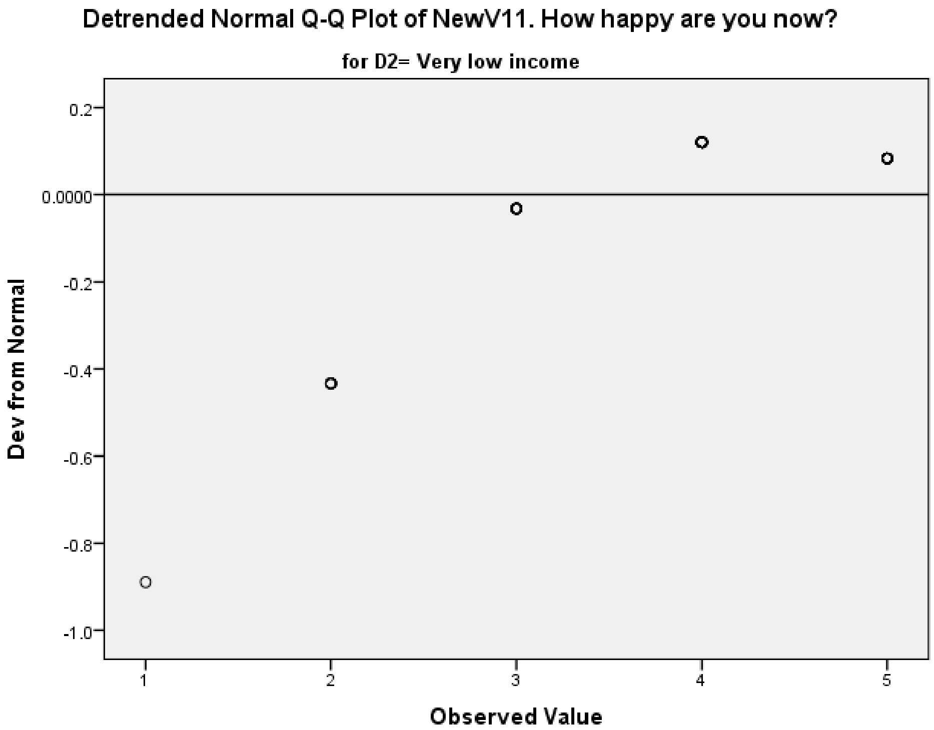

Normal Q-Q Plot of NewV11. How happy are you now?
for D2= Very low income
Expected Normal
2
1
0
-1
-2
-3
-4
0
1
2
3
4
5
6
Observed Value

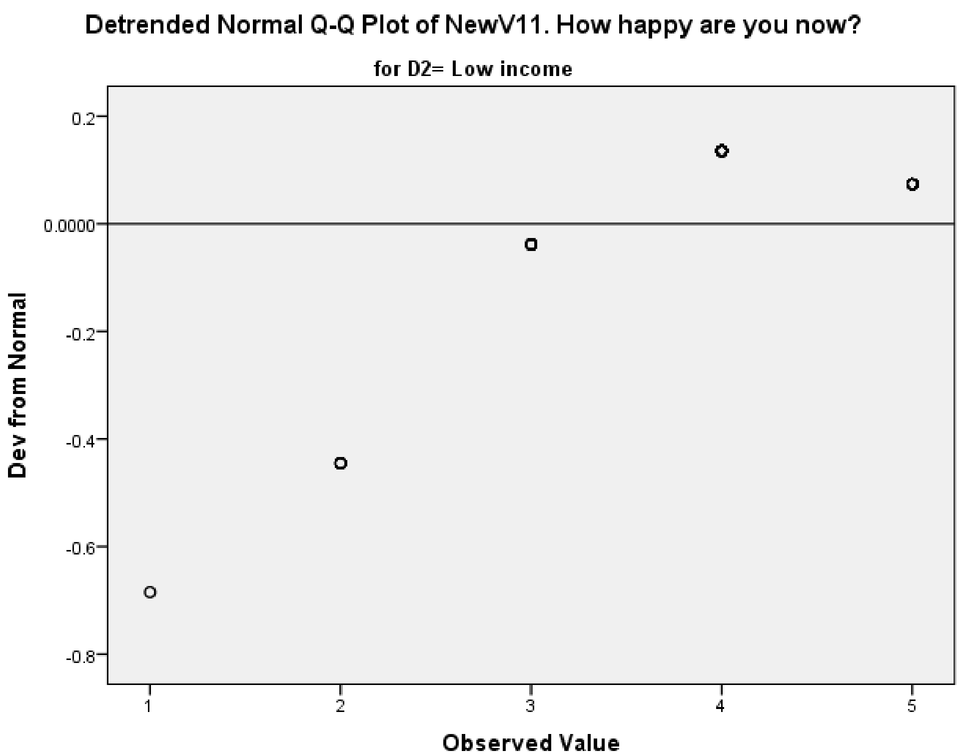

Normal Q-Q Plot of NewV11. How happy are you now?
for D2= Low income
Expected Normal
Observed Value
2
1
0
-1
-2
-3
-4
0
1
2
3
4
5
6

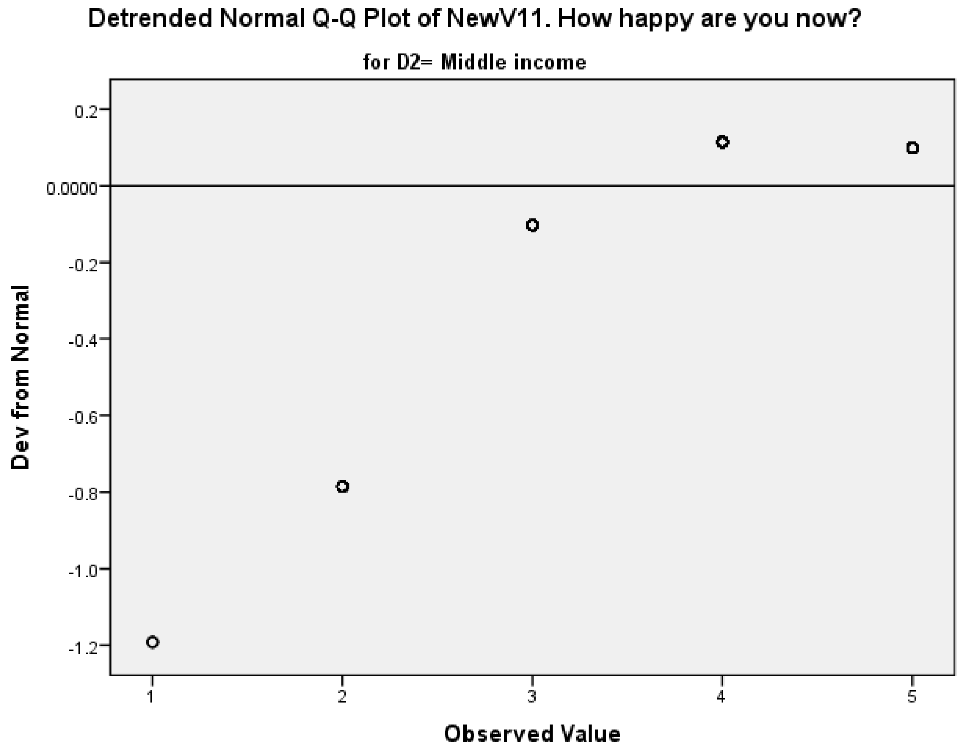

Normal Q-Q Plot of NewV11. How happy are you now?
for D2= Middle income
Expected Normal
Observed Value
2
1
0
-1
-2
-3
-4
0
1
2
3
4
5
6

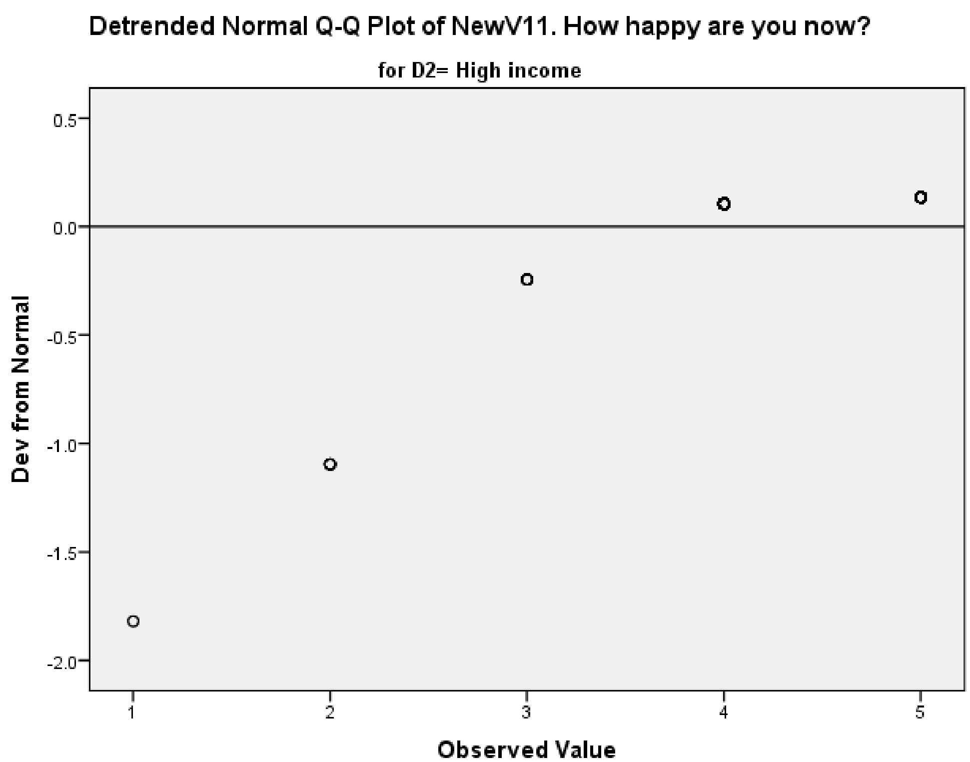

Normal Q-Q Plot of NewV11. How happy are you now?
for D2= High income
Expected Normal
Observed Value
1
0
-1
-2
-3
-4
-5
0
1
2
3
4
5
6

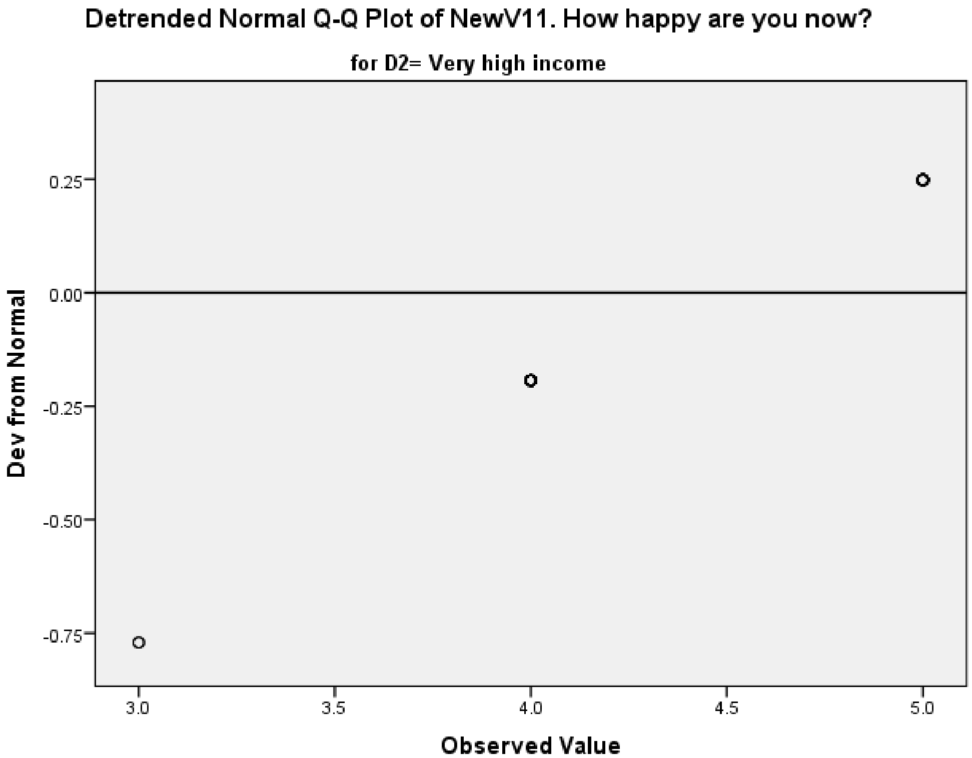

Normal Q-Q Plot of NewV11. How happy are you now?
for D2= Very high income
Expected Normal
Observed Value
2
1
0
-1
-2
-3
2.5
3.0
3.5
4.0
4.5
5.0
5.5


Detrended Normal Q-Q Plot of NewV11. How happy are you now?
for D2= Very low income
Dev from Normal
0.2
0.0000
-0.2
-0.4
-0.6
-0.8
-1.0
1
2
3
4
5
Observed Value


Detrended Normal Q-Q Plot of NewV11. How happy are you now?
for D2= Low income
Dev from Normal
0.2
0.0000
-0.2
-0.4
-0.6
-0.8
1
2
3
4
5
Observed Value


Detrended Normal Q-Q Plot of NewV11. How happy are you now?
for D2= Middle income
Dev from Normal
0.2
0.0000
-0.2
-0.4
-0.6
-0.8
-1.0
-1.2
1
2
3
4
5
Observed Value


Detrended Normal Q-Q Plot of NewV11. How happy are you now?
for D2= High income
Dev from Normal
0.5
0.0
-0.5
-1.0
-1.5
-2.0
1
2
3
4
5
Observed Value


Detrended Normal Q-Q Plot of NewV11. How happy are you now?
for D2= Very high income
Dev from Normal
0.25
0.00
-0.25
-0.50
-0.75
3.0
3.5
4.0
4.5
5.0
Observed Value