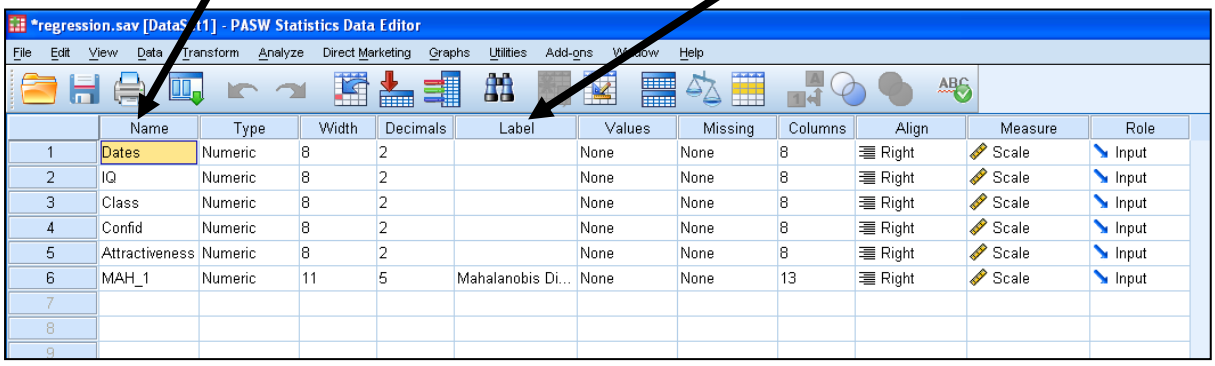
Multiple Regression

A. Arranging your data

Click on the 'Variable View' window.

Give your variables names here. Maximum eight characters and no spaces.

Give your variables proper labels here.



	Name	Type	Width	Decimals	Label	Values	Missing	Columns	Align	Measure	Role
1	Dates	Numeric	8	2		None	None	8	Right	Scale	Input
2	IQ	Numeric	8	2		None	None	8	Right	Scale	Input
3	Class	Numeric	8	2		None	None	8	Right	Scale	Input
4	Confid	Numeric	8	2		None	None	8	Right	Scale	Input
5	Attractiveness	Numeric	8	2		None	None	8	Right	Scale	Input
6	MAH_1	Numeric	11	5	Mahalanobis Di...	None	None	13	Right	Scale	Input
7											
8											
9											

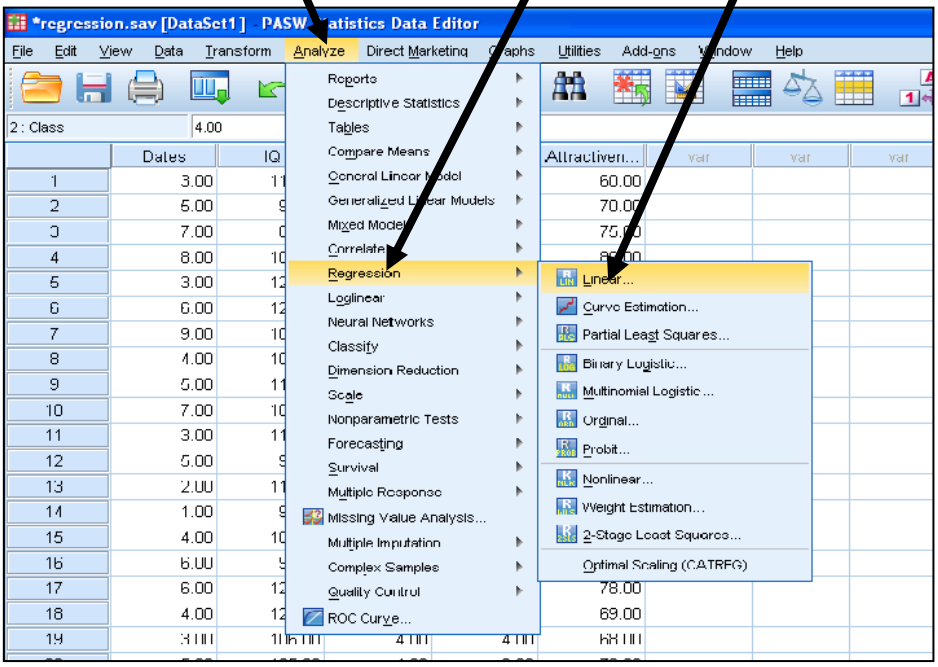
Click on the 'Data View' window.

In this example, we are predicting number of dates in a period of time, form variables such as IQ, social class, confidence and attractiveness.

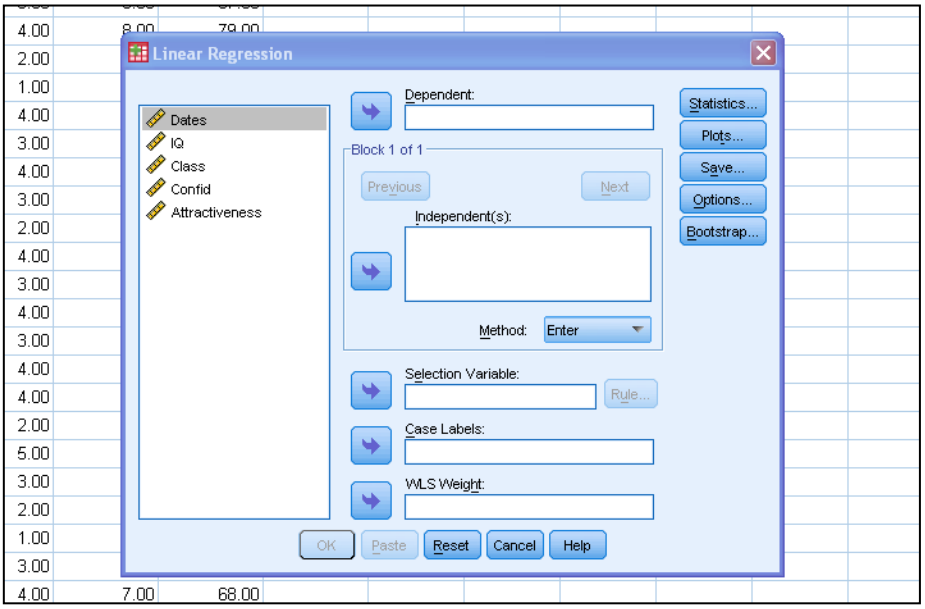
	Dates	IQ	Class	Confid	Attractiven...	var	var
1	3.00	110.00	2.00	5.00	60.00		
2	5.00	98.00	4.00	7.00	70.00		
3	7.00	89.00	3.00	8.00	75.00		
4	8.00	104.00	5.00	6.00	89.00		
5	3.00	120.00	2.00	2.00	55.00		
6	6.00	121.00	3.00	6.00	57.00		
7	9.00	104.00	4.00	8.00	79.00		
8	4.00	107.00	2.00	7.00	68.00		
9	5.00	113.00	1.00	8.00	65.00		
10	7.00	108.00	4.00	8.00	78.00		
11	3.00	115.00	3.00	6.00	55.00		
12	5.00	92.00	4.00	7.00	74.00		
13	2.00	113.00	3.00	4.00	58.00		

B. Running the Regression

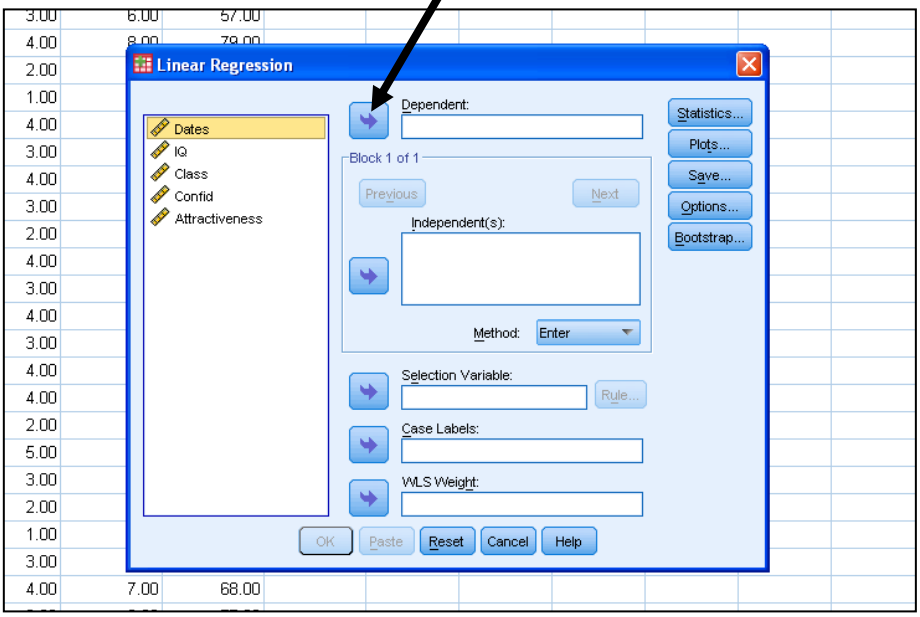
Go to 'Analyse' across the top. 'Regression' and 'Linear



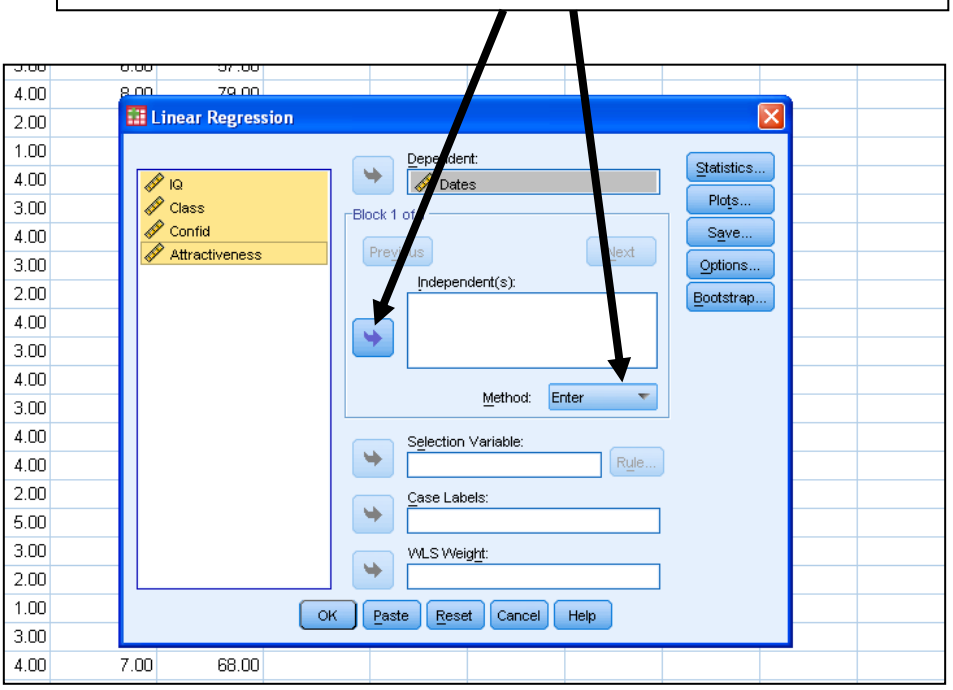
You will then see a box appear which looks like the one below



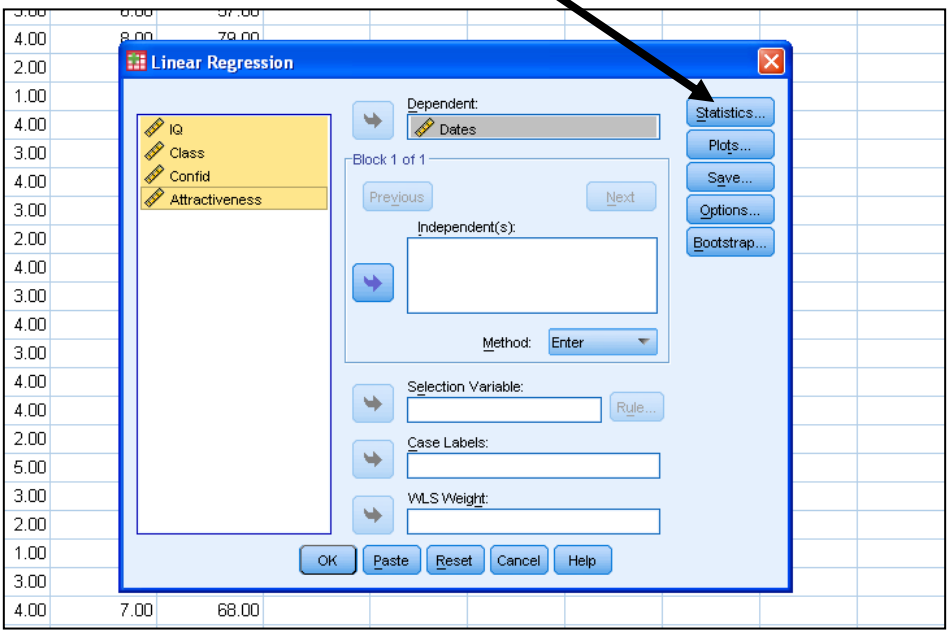
The name of your dependent variable is Dates. Highlight this, and click on the arrow to move it over to the Dependent Variable box.



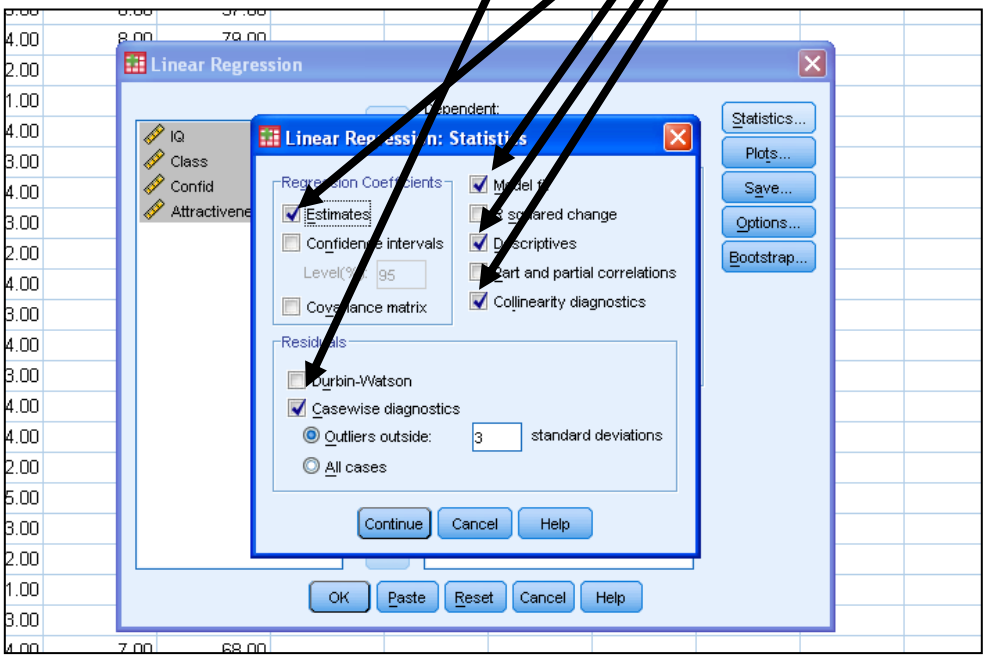
The names of the Independent or Predictor variables are IQ, class, confid and attractiveness. Highlight these and click the arrow to move across. For 'Method', make sure 'Enter' is selected.



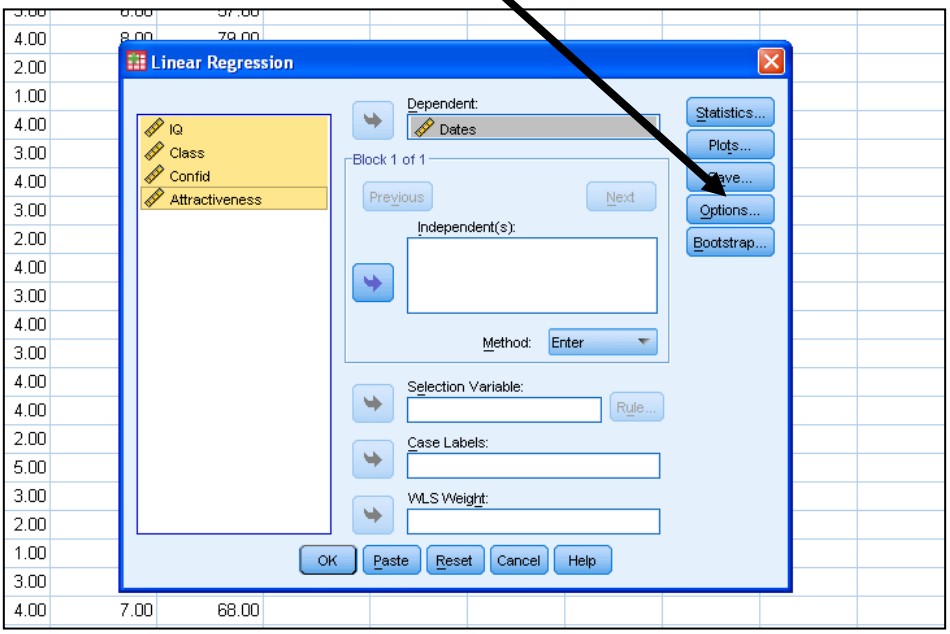
Click the 'Statistics' button



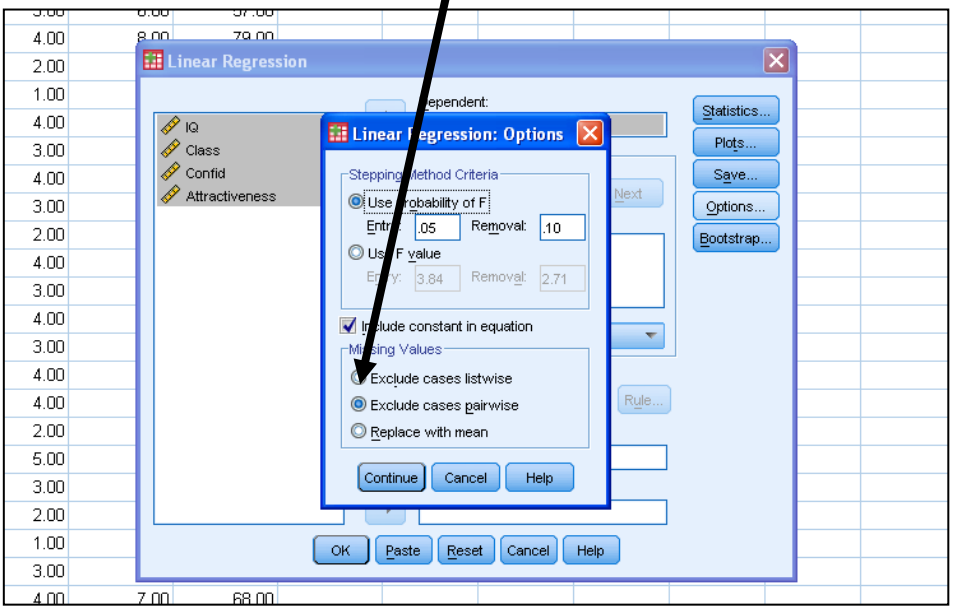
Click the boxes marked 'Model fit', 'Descriptives', 'Collinearity Diagnostics' and 'Estimates'. Also 'Casewise Diagnostics' and Outliers outside 3. Then click 'Continue'



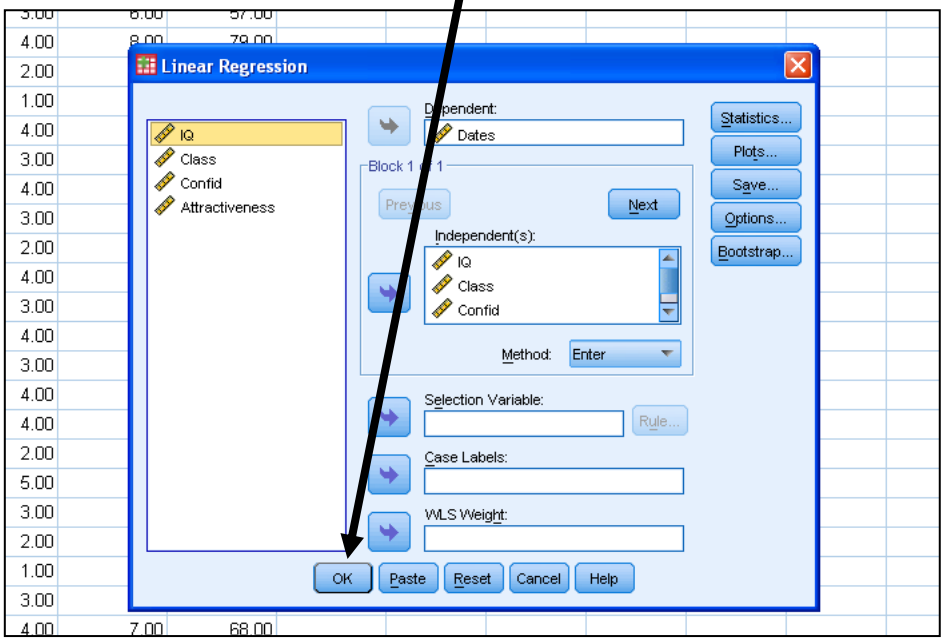
Click the 'Options' box



In the Missing Values section, click 'Exclude cases pairwise'. Click 'Continue'



Back to this screen and click on 'OK'



The Output

On this part of the output, look at the table labelled correlations. Check that the criterion variable (Dates) shows some relationship to the predictor variables.

Correlations

		Dates	IQ	Class	Confid	Attractiveness
Pearson Correlation	Dates	1.000	-.018	.350	.556	.543
	IQ	-.018	1.000	-.159	-.264	-.314
	Class	.350	-.159	1.000	.252	.649
	Confid	.556	-.264	.252	1.000	.479
	Attractiveness	.543	-.314	.649	.479	1.000
Sig. (1-tailed)	Dates	.	.462	.029	.001	.001
	IQ	.462	.	.201	.079	.046
	Class	.029	.201	.	.090	.000
	Confid	.001	.079	.090	.	.004
	Attractiveness	.001	.046	.000	.004	.
N	Dates	30	30	30	30	30
	IQ	30	30	30	30	30
	Class	30	30	30	30	30
	Confid	30	30	30	30	30
	Attractiveness	30	30	30	30	30

For 'collinearity diagnostics' inspect the table labelled Coefficients. Look at the column headed 'Tolerance' If this value is low and near 0, then this indicates a possibility of collinearity

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	-9.427	4.782		-1.971	.060		
	IQ	.046	.033	.221	1.400	.174	.883	1.133
	Class	.046	.405	.022	.113	.911	.573	1.744
	Confid	.613	.250	.419	2.452	.022	.751	1.331
	Attractiveness	.076	.042	.397	1.806	.083	.453	2.208

a. Dependent Variable: Dates

Look in the 'Model Summary' box under the heading R Square. This indicates how much of the variance is explained by the model. With small samples use the Adjusted R Square figure. Here it explains 36.5% of the variance.

To test the statistical significance of the model, inspect the ANOVA table. The model in this case reaches significance at p = 0.004

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.673[a]	.452	.365	1.71839	1.714

a. Predictors: (Constant), Attractiveness, IQ, Confid, Class

b. Dependent Variable: Dates

ANOVA[b]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	60.978	4	15.245	5.163	.004[a]
	Residual	73.822	25	2.953		
	Total	134.800	29			

a. Predictors: (Constant), Attractiveness, IQ, Confid, Class

b. Dependent Variable: Dates

Look in the 'Coefficients' box. Consult the column Beta. Confid makes the strongest unique contribution to explaining the dependent variable.

For each variable check 'sig' This should tell you whether each variable is making a statistically significant unique contribution.

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	-9.427	4.782		-1.971	.060		
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a. Dependent Variable: Dates

Writing your results section

This is a suggestion of how to write your results section.

Results section

Table 1 below, shows the correlations between the variables.

Table 1: Correlations between the variables

	IQ	Class	Confidence	Attractiveness
Dates	-0.018	0.35*	0.55**	0.54**
IQ		-0.15	-0.26	-0.31*
Class			0.25	0.64**
Confidence				0.47*

* p< 0.05 ** p< 0.01

Table 1 illustrates that dates are strongly correlated with confidence (r=0.55) and attractiveness (r=0.54). It is also correlated with class (r=0.35). The predictor variable attractiveness was also negatively correlated with IQ (r=-0.31), class (r=0.64) and confidence (r=0.47). No other correlations between the variables were observed.

A multiple regression was performed to assess the contributions of the predictor variables IQ, class, confidence and attractiveness to number of dates.

Taken together, the four predictor variables accounted for 36% of the variance in number of dates, (Adjusted R squared = .36). Taken together, the four variables significantly predicted number of dates (F (4,25) = 5.16, p=0.004).

For each predictor variables taken separately, the beta values are given in Table 2 below.

Table 2: Unstandardised and standardised regression coefficients

	B	Std Error	Beta
IQ	0.04	0.03	0.22
Class	0.04	0.40	0.02
Confidence	0.61	0.25	0.41*
Attractiveness	0.07	0.42	0.39

* p< 0.05

Table 2 indicates that the only predictor variable which significantly predicted number of dates was confidence. The other variables did not significantly predict number of dates.

Dr Martin Graff