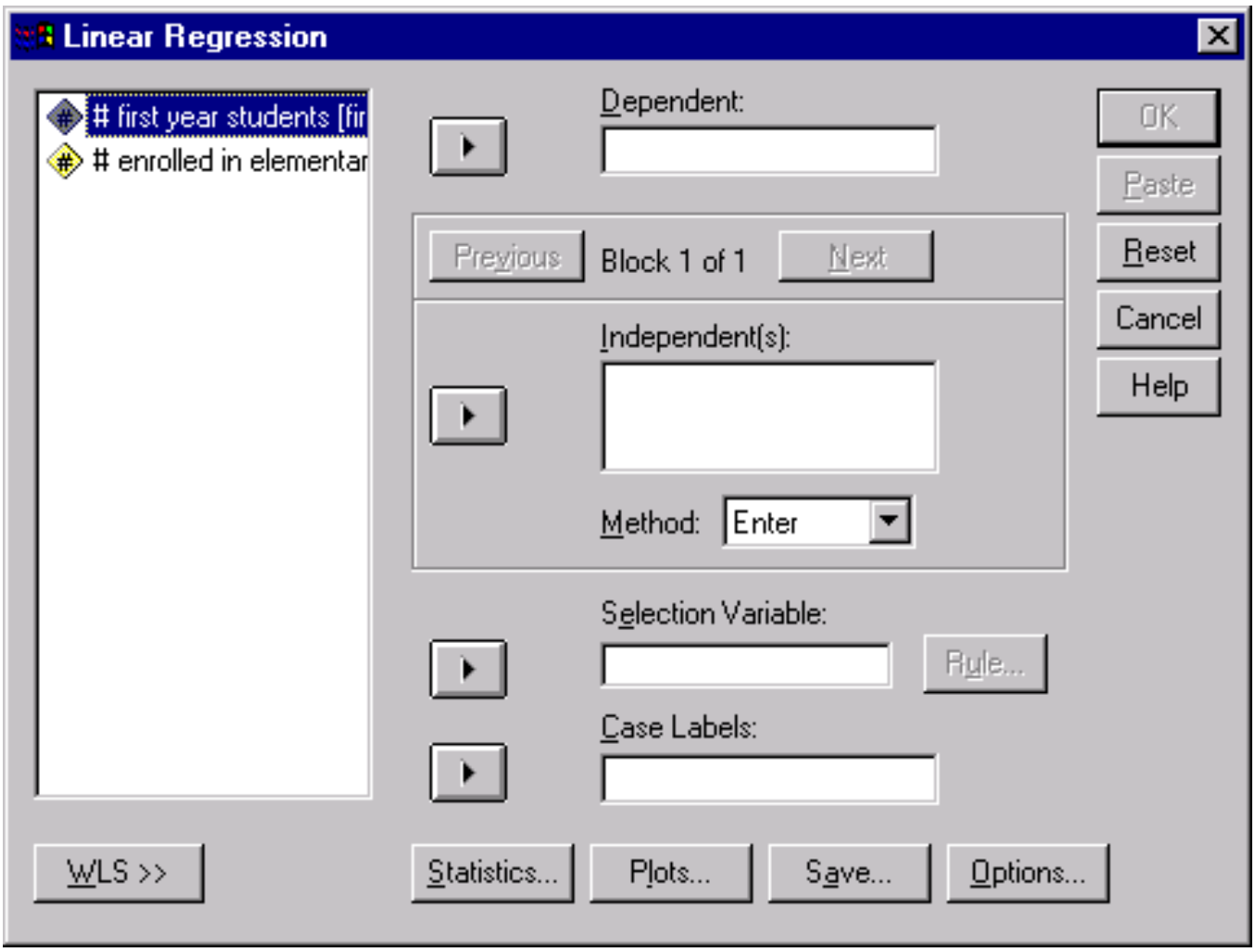
SPSS Chapter 2 Example 1 – Fitting a Line to Data (continued)

After creating a scatterplot of the data, the head of the math department may wish to perform a regression analysis of the data. The data are the same as the example of the scatterplot.

Follow these steps to perform a regression analysis:

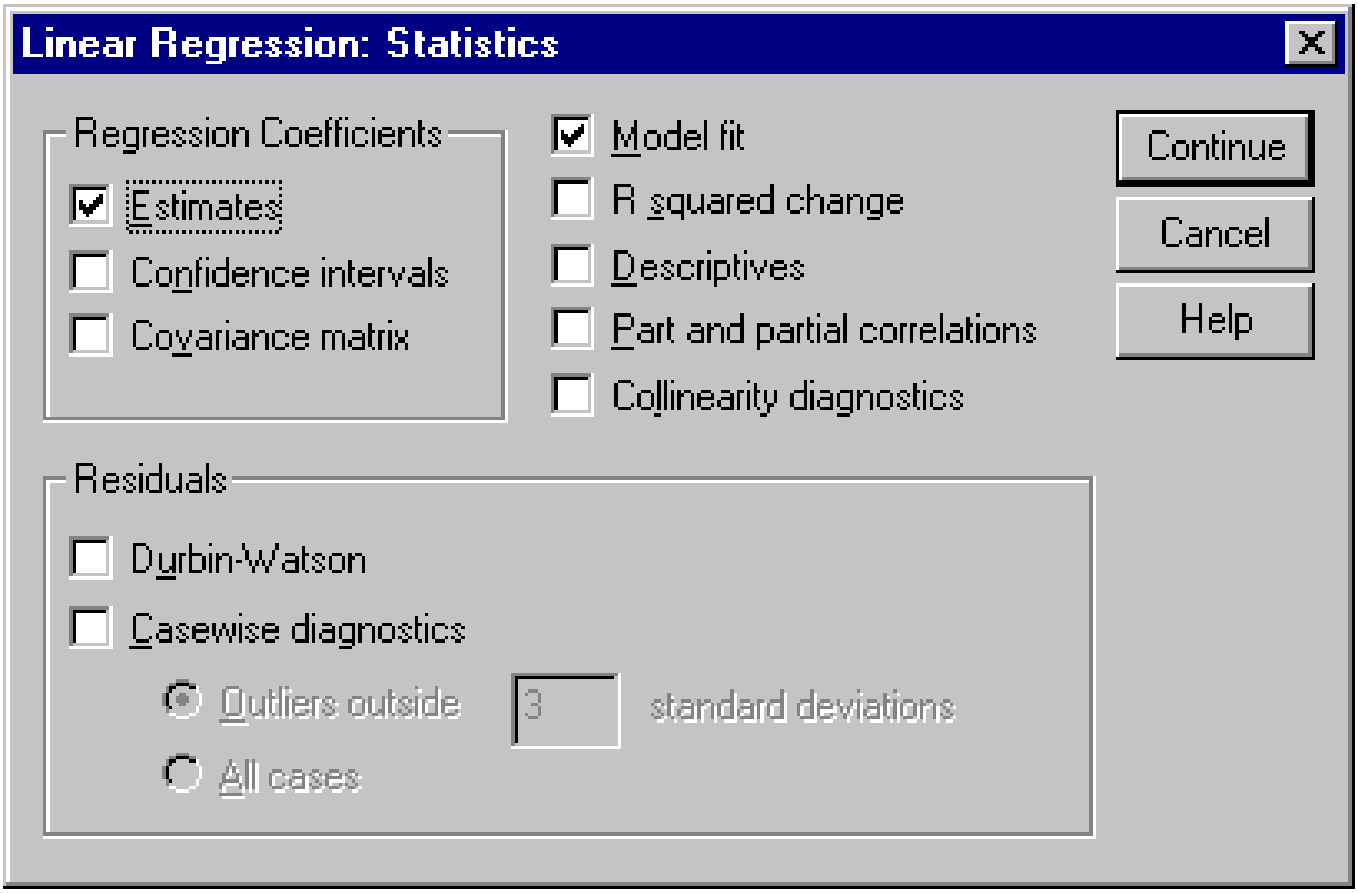
7. Click **Analyze**, click **Regression**, and click **Linear**. The following window will appear.



8. Click "**firstyr**" (a.k.a. "**# first year students**") and click▲to move "**firstyr**" into the box entitled ***Independent(s)***.

9. Click "**enroll**" (a.k.a. "**# enrolled in elementary math**") and click▲to move "**enroll**" into the box entitled ***Dependent***.

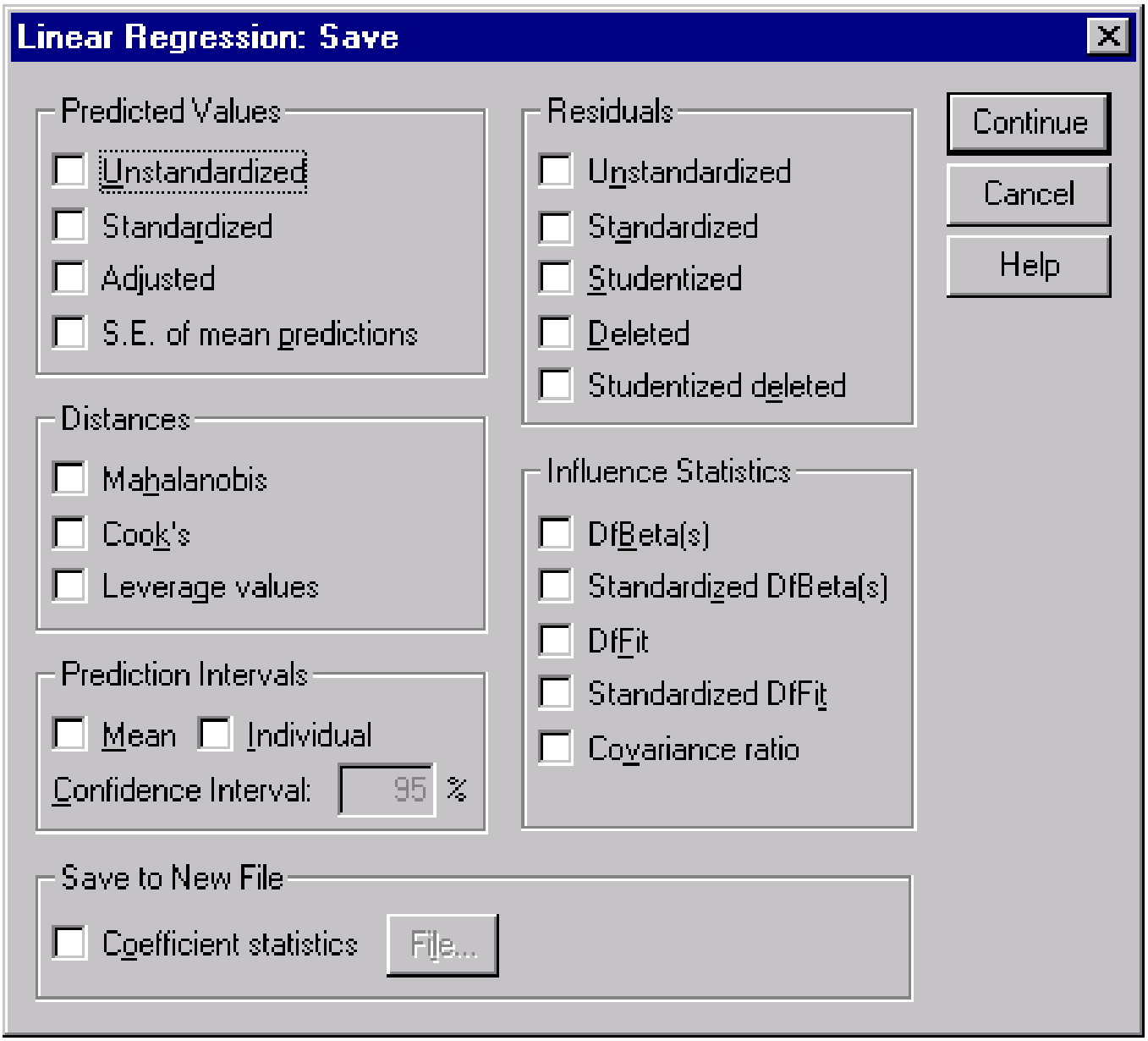
10. To calculate additional statistics, click the button entitled **Statistics** and the following window will appear.



11. The default conditions for this window are **Estimates** (in the box entitled ***Regression Coefficients***) and **Model Fit**. Click **Casewise diagnostics** so that a checkmark (✓) appears in the box before **Casewise diagnostics**. The default condition for this ***Residuals*** feature is to display all outliers outside of three standard deviations.

12. If you want to perform any other statistical calculations for this example, just check (✓) them. Now click **Continue**.

13. Click the **Save** button and the following window will appear.



14. Click **Unstandardized** and **Standardized** in the box entitled ***Residuals***. Click **Unstandardized** in the box entitled ***Predicted Values***. Click **Continue**.

15. Click **OK**.

The SPSS output for this example of the Linear Regression is the following:

Variables Entered/Removed[b]

Model	Variables Entered	Variables Removed	Method
1	# first year students[a]	.	Enter

a. All requested variables entered
b. Dependent Variable: # enrolled in elementary math

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.833[a]	.694	.643	188.95

a. Predictors: (Constant), # first year students
b. Dependent Variable: # enrolled in elementary math

The correlation is r = .833. The R^2 statistic above indicates that 69.4% of the variance in y ("response variable") is explained by changes in x ("explanatory variable").

ANOVA[b]

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	486552.229	1	486552.229	13.628	.010[a]
	Residual	214209.271	6	35701.545		
	Total	700761.500	7			

a. Predictors: (Constant), # first year students
b. Dependent Variable: # enrolled in elementary math

We will discuss the ANOVA table in chapter 10.

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	2492.692	1267.199		1.967	.097
	# first year students	1.066	.289	.833	3.692	.010

a. Dependent Variable: # enrolled in elementary math

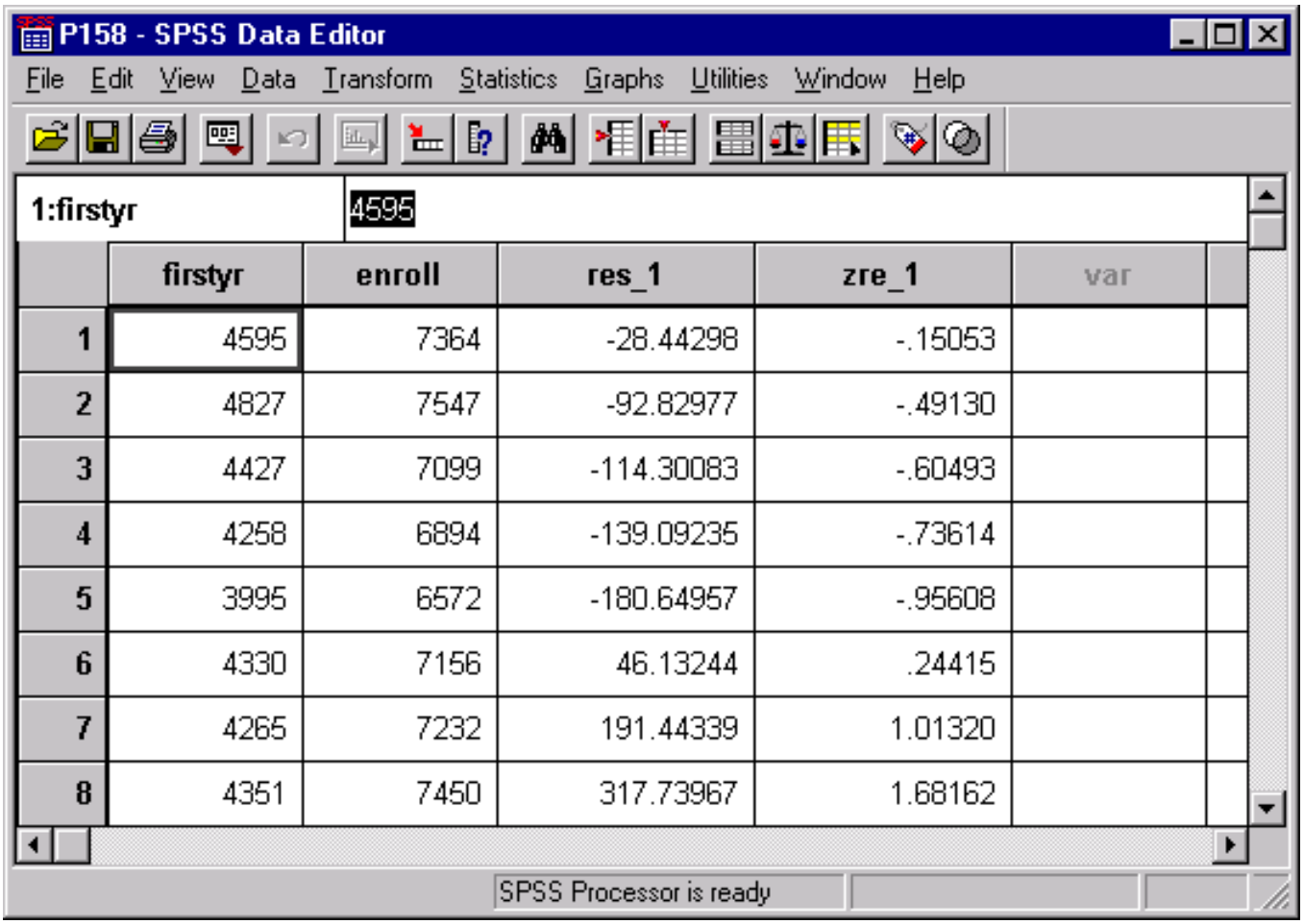
The least square equation for the model is found in the ***Unstandardized Coefficient*** table under the ***B*** column. It is y = 2492.692 + 1.066x.

Residual Statistics[a]

	Minimum	Maximum	Mean	Std. Deviation	N
Predicted Value	6752.65	7639.83	7164.25	263.64	8
Residual	-180.65	317.74	-3.41E-13	174.93	8
Std. Predicted Value	-1.561	1.804	.000	1.000	8
Std. Residual	-.956	1.682	.000	.926	8

a. Dependent Variable: # enrolled in elementary math

The Residuals are saved in the SPSS Data Editor:



	firstyr	enroll	res_1	zre_1	var
1	4595	7364	-28.44298	-.15053	
2	4827	7547	-92.82977	-.49130	
3	4427	7099	-114.30083	-.60493	
4	4258	6894	-139.09235	-.73614	
5	3995	6572	-180.64957	-.95608	
6	4330	7156	46.13244	.24415	
7	4265	7232	191.44339	1.01320	
8	4351	7450	317.73967	1.68162	