

Charting LibQUAL+(TM) Data

Jeff Stark
Training & Development Services
Texas A&M University Libraries
Texas A&M University

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The directions in this handout are written to be used with SPSS version 10 and Microsoft Excel 97 or 2000 and are based on the data included in the “ACADEMY.SAV” SPSS file. Although there may be slight differences, these instructions should also work for later versions of Excel and SPSS.

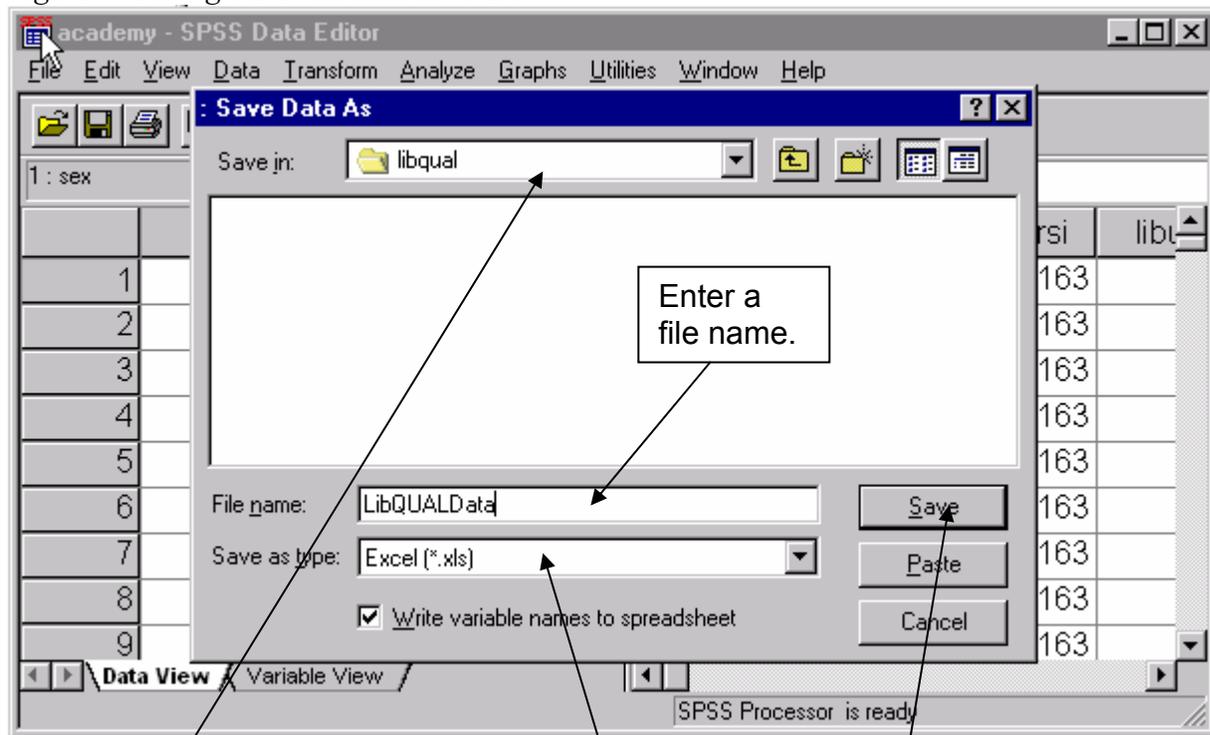
Exporting Data from SPSS into Microsoft Excel 97/2000

Getting your data from SPSS into Excel is one of the easiest parts of the process.

With the **data file open** in SPSS:

1. Click the **File** menu and click **Save As**.
2. Click the drop-down arrow in the **Save as type** list and select **Excel (*.xls)**.
3. Navigate to and select the folder in which you wish to save the file.
4. Enter a name for the file in the **File name** box.

Figure 1: Saving the SPSS data to Excel



Navigate to and select the folder in which to save the file.

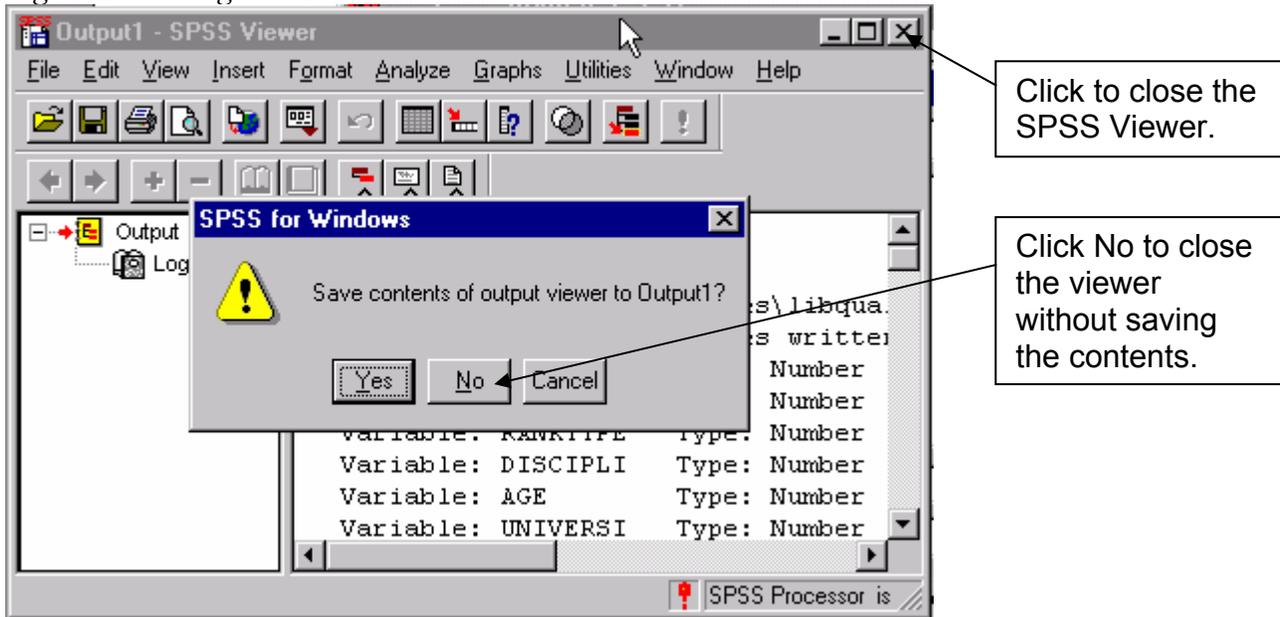
Select Excel as the file type.

Click Save when finished.

5. Click the **Save** button.

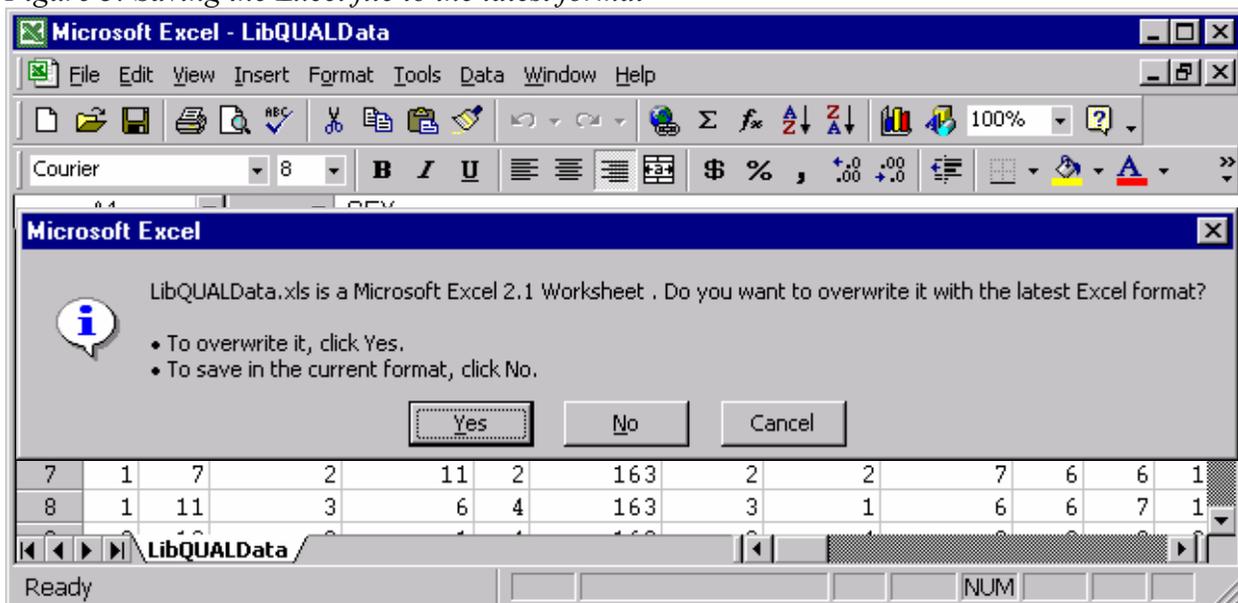
- Close the SPSS Viewer window and select **No** when asked “Save contents of output viewer to Output1?”.

Figure 2: Closing the SPSS Viewer



- Locate and open the file in Microsoft Excel.
- In Excel, click the **File** menu and select **Save**. A dialog box will open to tell you the file was saved as a Microsoft Excel 2.1 Worksheet.

Figure 3: Saving the Excel file to the latest format



- Click **Yes** to overwrite the file with the latest Excel format.

You can now work with your data to create charts in Excel.

Setting up the Data

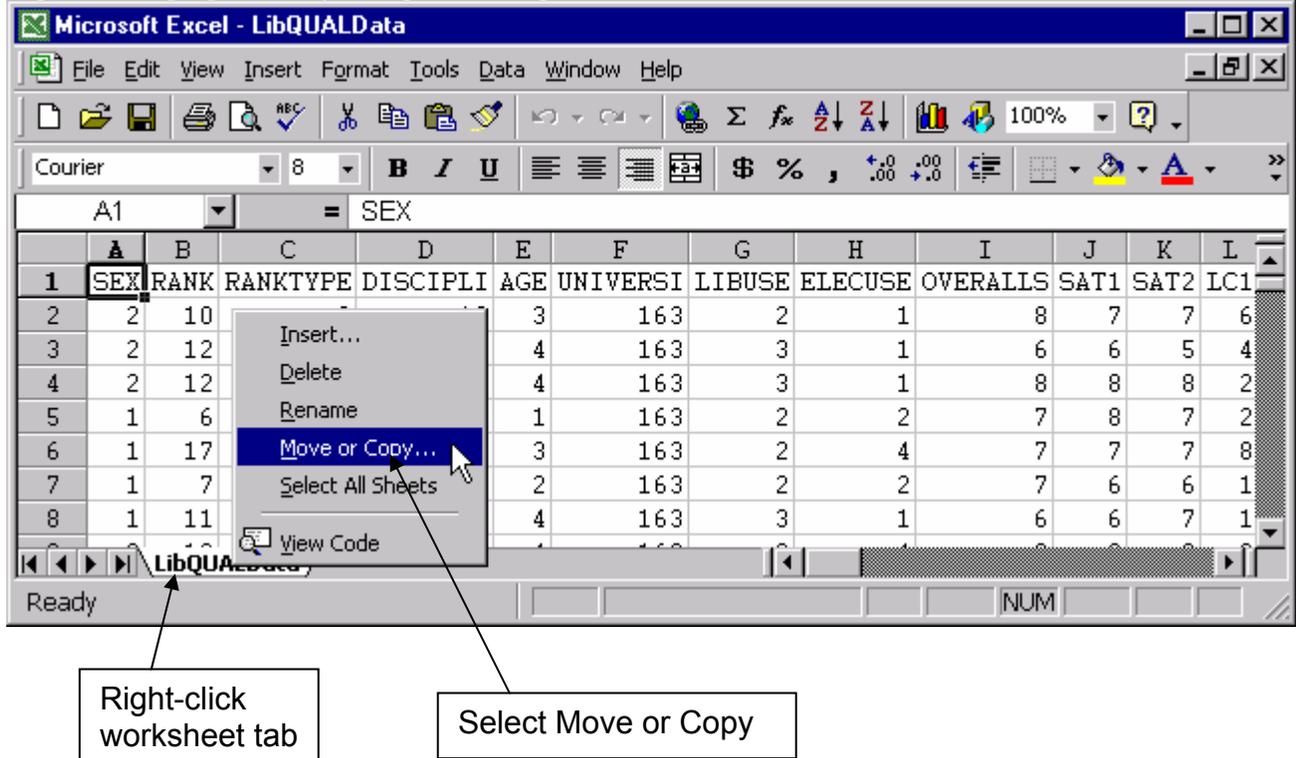
The data you are starting with is essentially raw data from six different institutions. You will need to perform calculations to produce means and frequencies of the data on which to base your charts. There are a few other things we need to do before we start creating charts.

To help organize the data, we will create several additional worksheets for the different types of data we will be working with. The first new worksheet we create will be a copy of the original data we are starting with. Because we will be manipulating data it is helpful to **have a copy of the original** information in case we accidentally delete or change data in a way we don't want to.

To copy the original data to a new worksheet:

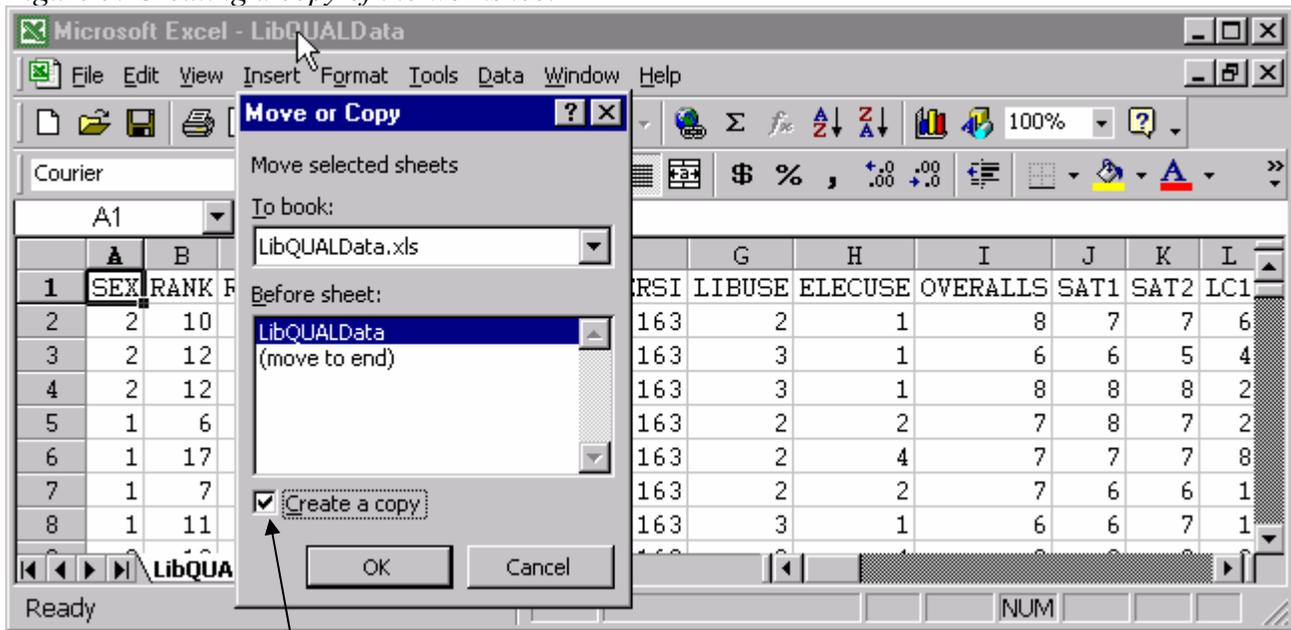
1. Right-click the worksheet tab at the bottom of the screen. (It should be labeled with the name of the Excel file.)
2. Click **Move or Copy**.

Figure 4: Pop up menu after right-clicking the worksheet tab



3. Click the check box next to **Create a copy** and click **OK**.

Figure 5: Creating a copy of the worksheet



Select Create a copy

4. Right-click on one of the tabs and select **Rename**.
5. Type **Original Data** and press **Enter**.
6. Right-click the other tab and select **Rename**.
7. Type **All Data** and press **Enter**.

Leave the Original Data tab alone unless you need to refer to it or copy data from it. Click the **All Data** tab and use this data for your calculations.

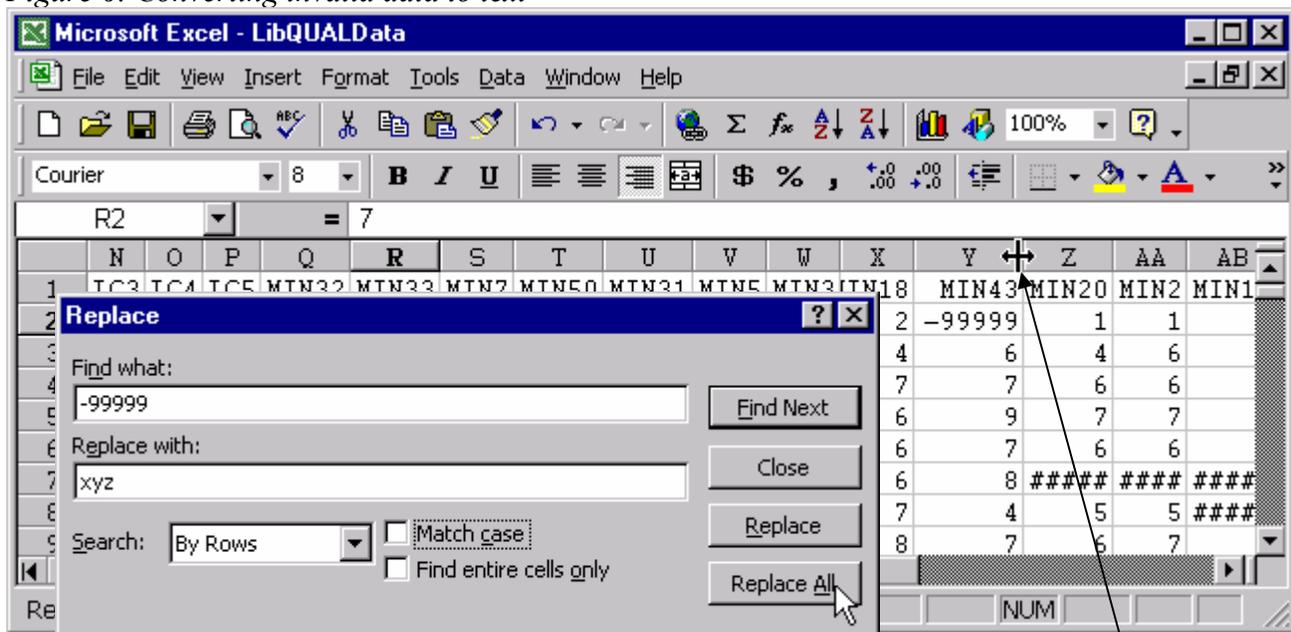
Dealing with Invalid Data

You may have notices that some of the cells contain five pound signs (#####). This just means that the width of the column is too narrow to display the full contents of the cell. If you resize the column width you will find that those cells contain “-99999”. This represents invalid data or items that were marked by participants as “Not Applicable”. In order to properly calculate means for the data we need to convert these invalid values to text. Text values will be ignored when calculating means.

To convert the -99999 values to text:

1. Click the **Edit** menu and select **Replace**.
2. Enter **-99999** in the **Find what** box.
3. Enter **xyz** in the **Replace with** box. (You can actually enter any text that you want.)

Figure 6: Converting invalid data to text



4. Click the **Replace All** button.

Click and drag to
resize columns

Isolating Data for Each Institution

If you wish to compare results between the different institutions you will need to separate the data for each institution. Each institution has its own identification number in the UNIVERSI field of the data set.

163=University of Zambia

167=Plato University

172=University Socrates

183=University of London

195=Melbourne University

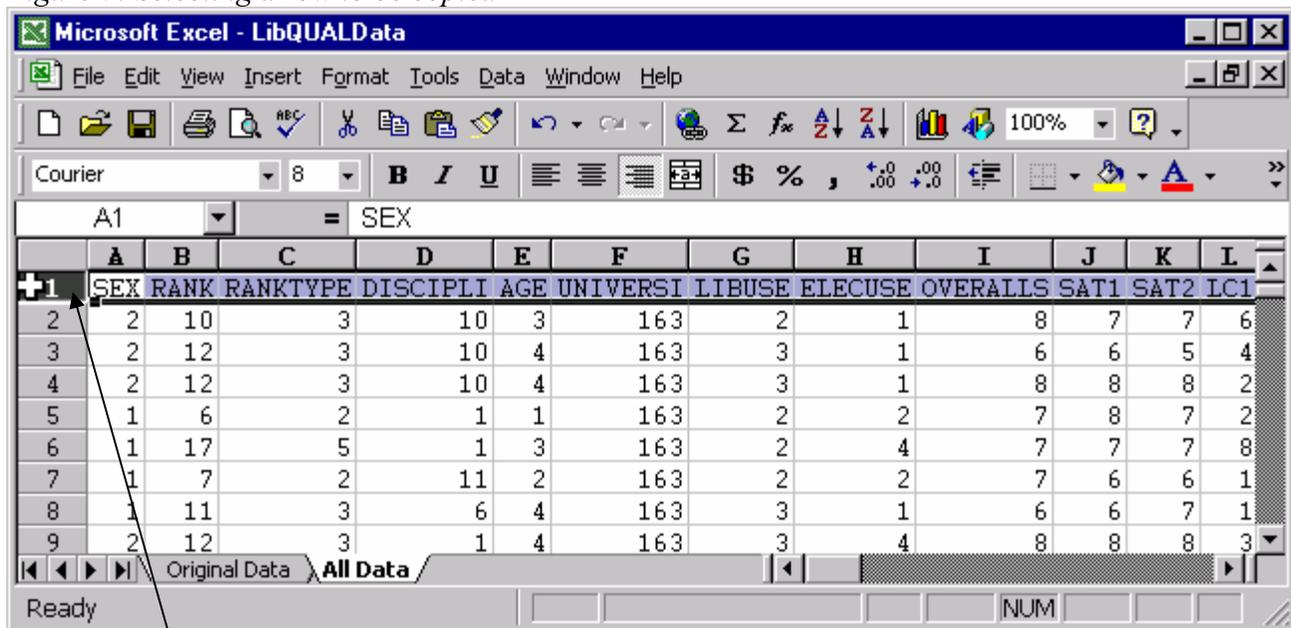
199=La Trobe University

To differentiate data from each institution we will create new worksheets for each one and copy each institution's data to their own worksheet.

To create worksheets for each institution:

1. Click the **Insert** menu then click **Worksheet**.
2. Repeat step 1 until you have six new worksheets.
3. Right-click each new worksheet tab and rename them. You can name them using their identification numbers or the names of their institutions.
4. Click the **All Data** tab.
5. Click the row heading for row 1 to select the entire row.

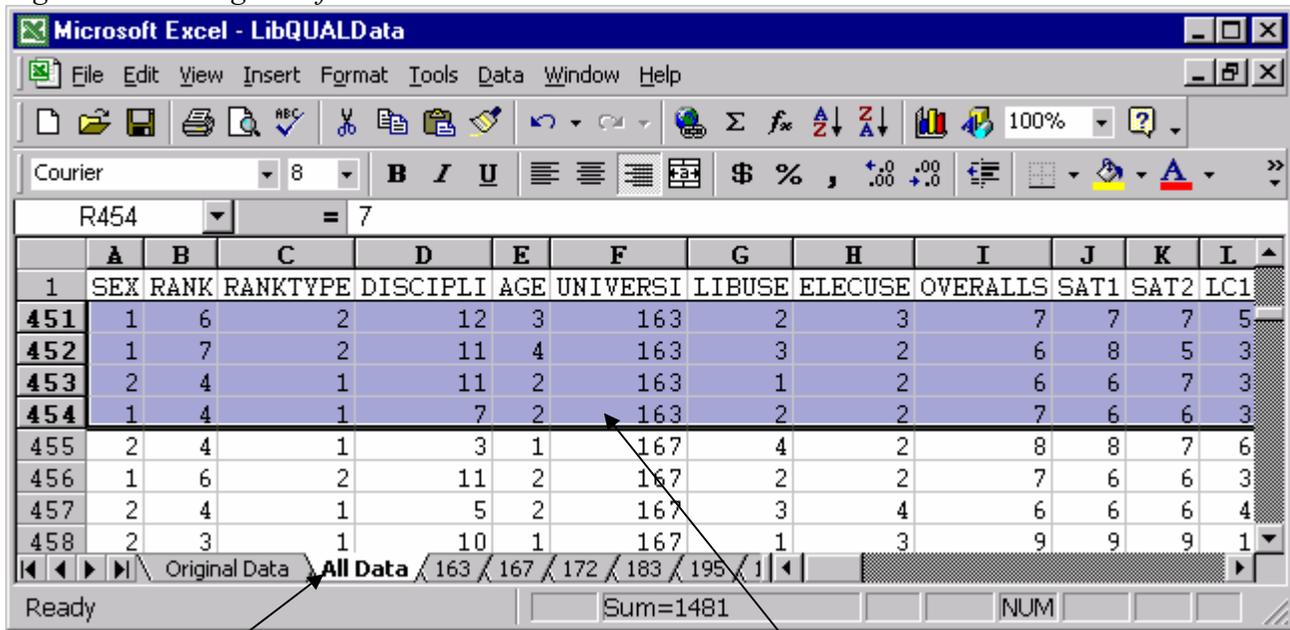
Figure 7: Selecting a row to be copied



Click to select the entire row.

6. Copy the row. (Ctrl+C or **Edit>Copy**)
7. Click the tab for one of the worksheets for an individual institution.
8. Click in cell A1.
9. Paste (Ctrl+V or **Edit>Paste**) the column headings on the new worksheet.
10. Repeat steps 7 through 9 for the worksheets for each institution.
11. Click the **All Data** tab. Now we will copy the data for each institution and paste in on their own worksheets.
12. Select the cells in the rows containing the same value in the UNIVERSI column. For example, all of the data from the University of Zambia are in the rows with **163** in the UNIVERSI column. The range of cells is **A2** through **CM454**. One way to select all of the cells in the range you want is to click in the first cell of the range (cell A2, for example) then scroll until you see the last cell in the range (cell CM454, for example). Hold down the **Shift** key then click in the last cell of the range. This will select the first and last cell and every cell in between.

Figure 8: Isolating data for each institution



Current Worksheet

Select the range of cells with the same value in the UNIVERSI field.

13. Copy the selected range. (Ctrl+C or **Edit>Copy**)
14. Click the worksheet tab for the institution's data you copied.
15. Click in cell A2 and paste the data (Ctrl+V or **Edit>Paste**)
16. Repeat steps 12 through 15 for each institution.

The cell ranges for the institutions are:

(163) University of Zambia	A2–CM454
(167) Plato University	A455–CM841
(172) University Socrates	A842–CM1380
(183) University of London	A1381–CM1798
(195) Melbourne University	A1799–CM2256
(199) La Trobe University	A2257–CM2786

Creating Descriptive Data

Now we are ready to create the descriptive data that we will display in the charts. First, however, we will create *new worksheets* for this data.

To create new worksheets for the descriptive data:

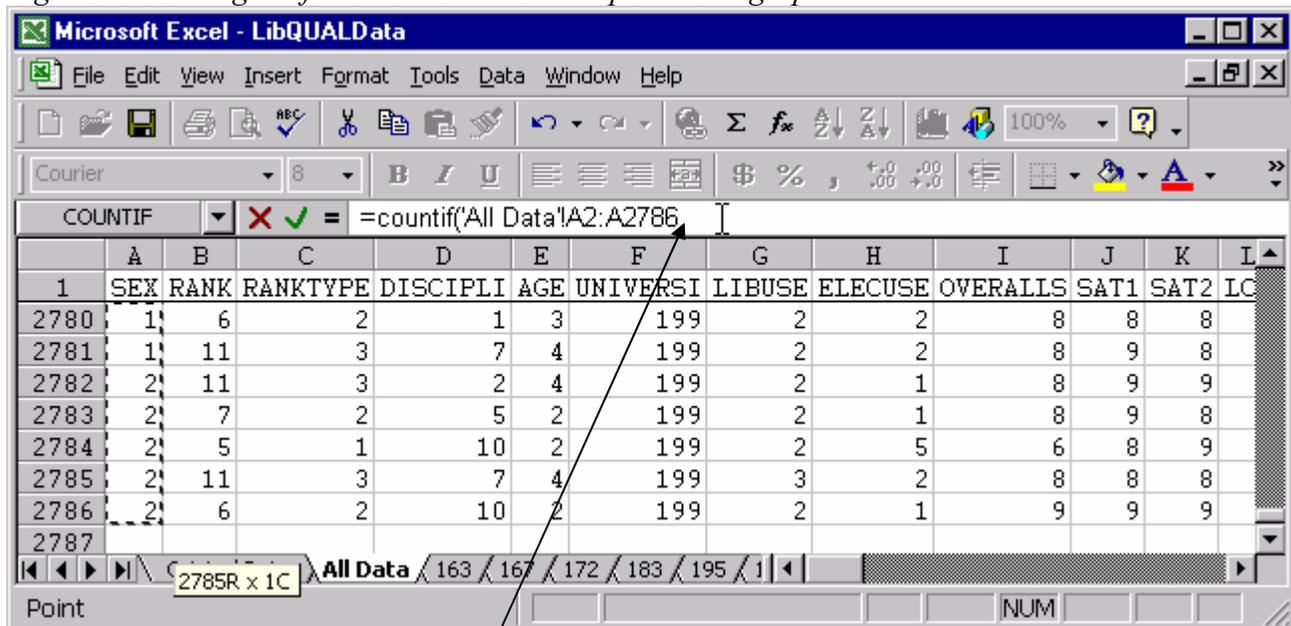
1. Click the **Insert** menu and select **Worksheet**.
2. Right-click the new worksheet tab and select **Rename**.
3. Enter **Demographics** as the new name for the worksheet tab and press **Enter**.
4. Click the **Insert** menu and select **Worksheet**.
5. Right-click the new worksheet tab and select **Rename**.
6. Enter **Ratings** as the new name for the worksheet tab and press **Enter**.

Creating Demographic Data

To create the demographic data:

1. Click the **Demographics** tab.
2. Enter **All Data** in cell **B2**.
3. Enter **Sex** in cell **B3**.
4. Enter **Female** in cell **B4**.
5. Enter **Male** in cell **B5**.
6. Enter **=countif(** in cell **C4**. In cell C4 we will create a formula that will count the number of instances of a certain value within a specified range of cells. For example, in column A for SEX, a value of 1 means that the respondent specified that she was a female, a value of 2 means that the respondents specified that he was a male. First we will create a formula to count the number of 1s in that column to indicate the number of female respondents. We will create a similar formula to count the number of 2s in the column to indicate the number of male respondents. The formula will use the COUNTIF function whose syntax looks like this:
=COUNTIF(<range of cells>, <value to be counted>). We will use some shortcuts reference the cell ranges on the other worksheets.
7. Click the **All Data** tab.
8. Click in the first cell that has data in the **SEX** column. (Probably cell A2)
9. Hold down the **Shift** and **Ctrl** keys at the same time and press the down arrow key on the keyboard. This selects the first through the last cells in the range on that worksheet.
10. Click at the end of the formula displayed in the formula bar.

Figure 9: Creating the formula to create descriptive demographic data



After selecting the range, click at the end of the formula to add the remaining elements needed for the function.

11. Enter a comma, the number 1 as the value to be counted, and a closing parenthesis so that the formula looks like this: **=countif('All Data'!A2:A2786,1)**
12. Press **Enter**.
13. Repeat steps 6 through 12 to count the number of male respondents. Of course you will enter the formula in cell C5 and enter a 2 as the value to be counted instead of the 1 used to count female respondents.

Use this procedure to create this type of data for each institution and for each type of demographic data including RANK, RANKTYPE, DISCIPLI, AGE, LIBUSE, and ELECUSE. It is recommended that all of this data be placed on the Demographics worksheet, but of course you should organize it a way that it is easiest for you to use. Remember to change the values to be counted. Double check to be sure the correct range of data is selected. Below are the values represented by the numbers in the data set.

SEX

- 1=Female
- 2=Male

RANK

- 1=Freshman (Year 1)
- 2=Sophomore (Year 2)
- 3=Junior (Year 3)
- 4=Senior (Year 4)
- 5=Undecided Undergraduate
- 6=Masters Student
- 7=Doctoral Student
- 8=Non-degree
- 9=Lecturer
- 10=Assistant Professor
- 11=Associate Professor
- 12=Professor
- 13=Public Services
- 14=Technical Services
- 15=Administrator
- 16=Systems
- 17=Research Scientist
- 18=Other Staff Position
- 19=Manager, Head of Unit

RANKTYPE

- 1=Undergrad
- 2=Grad
- 3=Faculty
- 4=Library Staff
- 5=Other

DISCIPLI

- 1=Agriculture/Environmental Studies
- 2=Architecture
- 3=Business
- 4=Education
- 5=Engineering
- 6=Health Sciences
- 7=Humanities
- 8=Law
- 9=Performing and Fine Arts
- 10=Science
- 11=Social Sciences
- 12=Other
- 13=General Studies
- 14=Undecided

AGE

- 1=Younger than 22
- 2=22-30
- 3=31-45
- 4=Older than 45

LIBUSE

- 1=Daily
- 2=Weekly
- 3=Monthly
- 4=Quarterly
- 5=Never

ELECUSE

- 1=Daily
- 2=Weekly
- 3=Monthly
- 4=Quarterly
- 5=Never

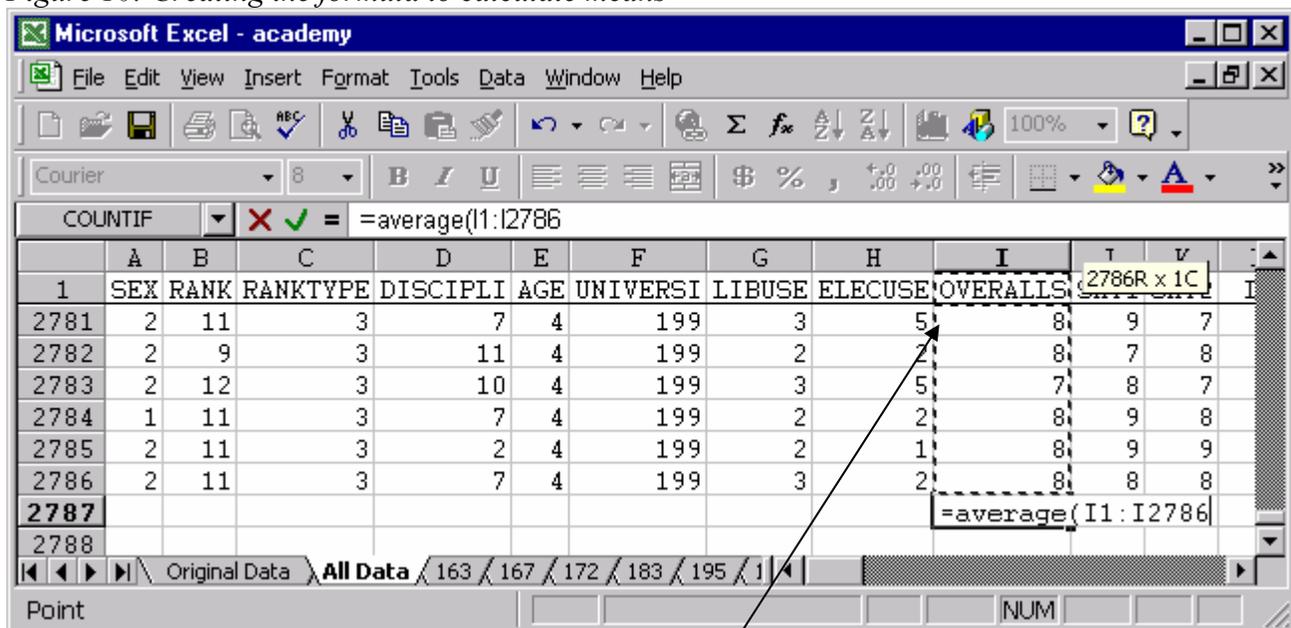
Setting Up the Ratings Data

Next, we will calculate the score means for the Minimum, Perceived, and Desired ratings for each question.

To calculate the mean scores for the ratings:

1. Click the **All Data** tab.
2. Click in cell **B2**.
3. Click the **Window** menu and select **Freeze Panes**. This will allow you to keep the labels for columns visible as the scroll down to the bottom of the columns.
4. Click the **Ratings** tab.
5. Enter **All Data** in cell **B2**.
6. Enter **OVERALLS** in cell **A3**, **SAT1** in cell **A4**, **SAT2** in cell **A5**, **LC1** in cell **A6**, **LC2** in cell **A7**, **LC3** in cell **A8**, **LC4** in cell **A9**, and **LC5** in cell **A10**.
7. Click the **All Data** tab.
8. Scroll down the end of the data.
9. Below the last cell in the **OVERALLS** column enter **=average(**. In this formula we will use the AVERAGE function to calculate the means of the numbers in the columns. The syntax of the formula looks like this: **=AVERAGE(<range of cells>)**
10. Click in the last cell containing data in the **OVERALLS** column.
11. Hold down the **Shift** and **Ctrl** keys and press the **Up arrow** on the keyboard. This will select the entire range from the last cell to the first cell.
12. Hold down the **Shift** key and press the **Down arrow** key on the keyboard. This will deselect the column label from the range.

Figure 10: Creating the formula to calculate means

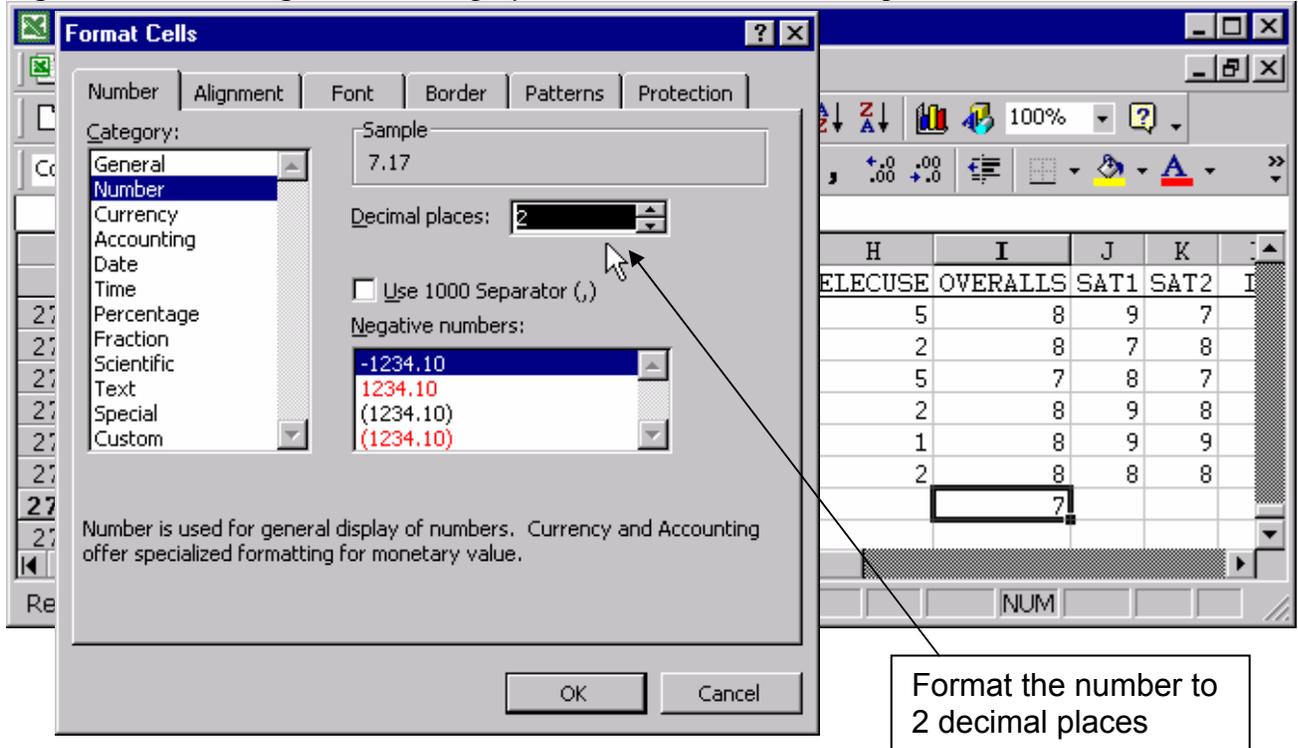


When the entire range is selected you can hold down the Shift key and press the Down arrow to deselect the label in row 1.

13. Press **Enter** to save the formula which should look like this: **=AVERAGE(I2:I2786)**

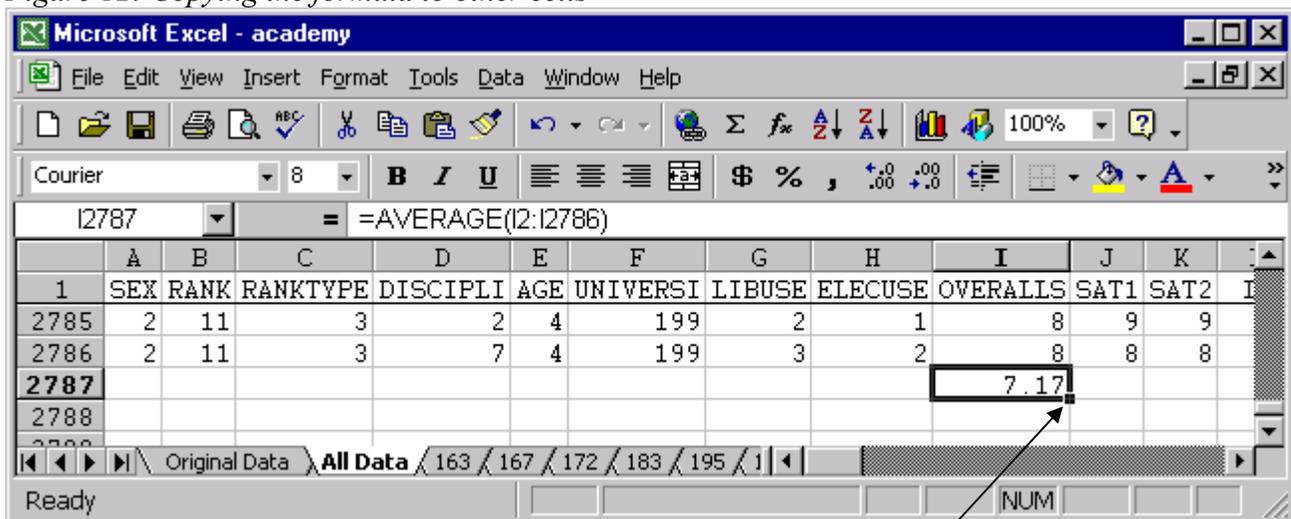
14. Right-click in the cell containing the formula you just created.
15. Select **Format Cells**.
16. Click the **Number** tab.
17. Change the **Decimal places** to **2** and click **OK**.

Figure 11: Formatting the cell to display the number to two decimal places



18. With the cell containing the formula still selected, place the tip of your mouse pointer on the small black square at the bottom right corner of the cell selection rectangle. Your mouse pointer should turn into a black plus sign (+).

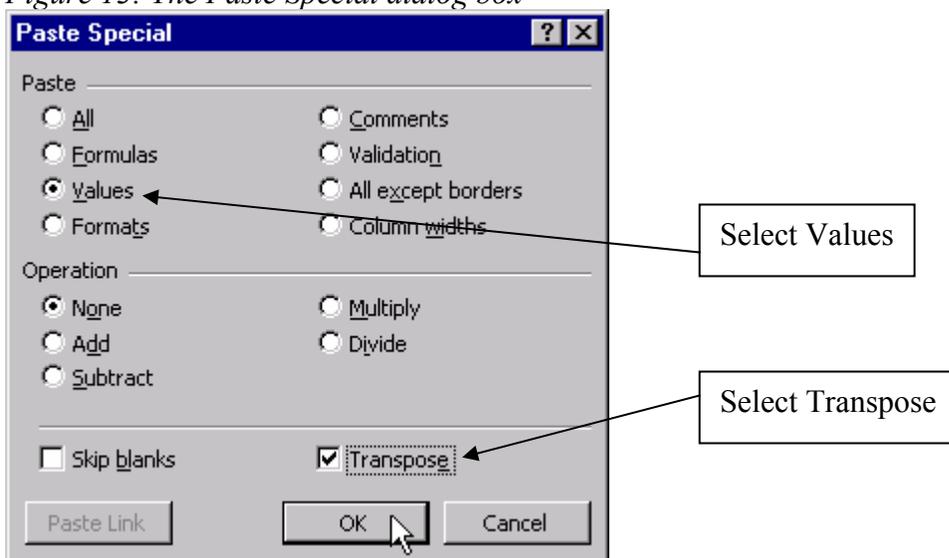
Figure 12: Copying the formula to other cells



Click and drag the small black square to copy the formula to adjacent cells.

19. Click and hold down the mouse button and drag to the right to select the cells in that row all the way to the end of the data set then let go of the mouse button. This should copy that formula to all of those cells to calculate the means for the rest of the columns. The cell references in the formulas should automatically adjust for each column.
20. Select the range of cells containing the means for columns **OVERALLS** through **LC5**.
21. Copy (Ctrl+C or **Edit>Copy**) that range of cells.
22. Click the **Ratings** tab.
23. Click in cell **B3**.
24. Click the **Edit** menu and select **Paste Special**.
25. Click **Values** under the **Paste** options.
26. Click **Transpose** near the bottom middle of the dialog box and click **OK**. This should paste those values in a column.

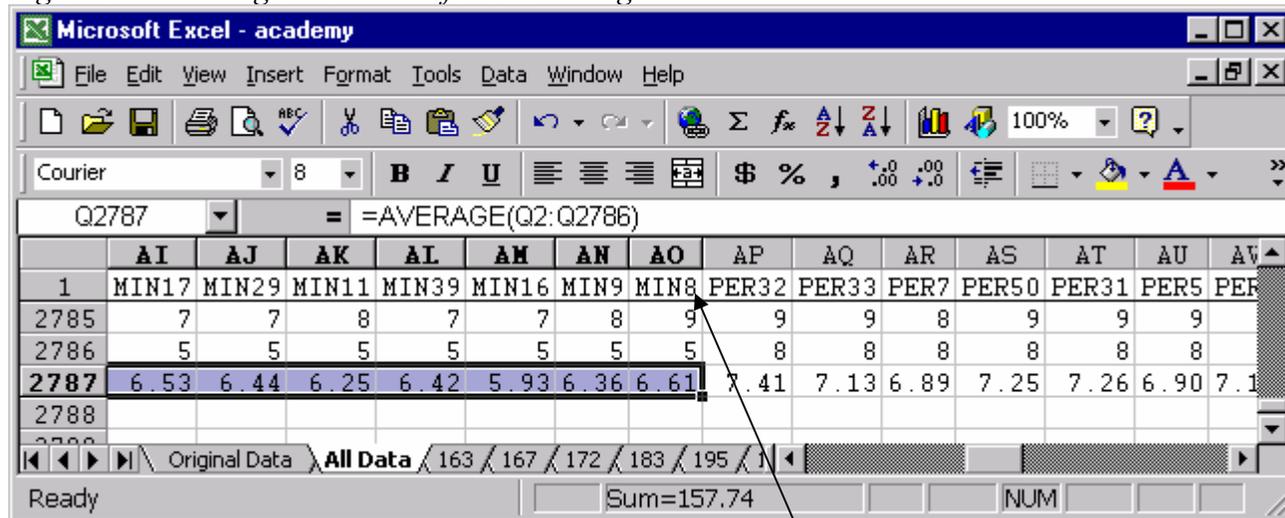
Figure 13: The Paste Special dialog box



27. While the range is still selected right-click within the range.
28. Select **Format Cells**.
29. Click the **Number** tab.
30. Click **Number** in the category list.
31. Change the **Decimal places** to **2** if necessary and click **OK**.
32. On the **All Data** worksheet, select the range of cells containing the labels for the **MIN** ratings. (This should be Q1 through AO1). We will use this and the next few steps as a shortcut for creating labels for the questions.
33. Copy those cells.
34. Switch back to the **Ratings** worksheet and click in cell **A13**.
35. Click the **Edit** menu and select **Paste Special**.
36. Select **Transpose** near the bottom middle of the dialog box and click **OK**.
37. Click in cell **A13**.
38. Click the **Edit** menu then click **Replace**.
39. Enter **MIN** in the **Find** what box.
40. Enter **Q** in the **Replace** with box.
41. Click the **Search** drop-down list and select **By Columns**.
42. Enter **Minimum** in cell **B12**, enter **Perceived** in cell **C12**, and enter **Desired** in cell **D12**.

43. On the **All Data** worksheet, select the range of cells containing the means for all of columns for the MIN ratings. (This should be column Q through column AO.)

Figure 14: Selecting mean scores for MIN ratings



Select the mean scores for MIN ratings

44. Copy the cells.
45. Switch back to the **Ratings** worksheet.
46. Click in cell **B13**, which should be right below the **Minimum** label and to the right of the **Q32** label.
47. Click the **Edit** menu and select **Paste Special**.
48. Click **Values** in the **Paste** area.
49. Click **Transpose** near the bottom of the dialog box and click **OK**.
50. With the range still selected, right-click within the range and select **Format Cells**.
51. Click the **Number** tab.
52. Select **Number** in the **Category** list.
53. Change the **Decimal places** to **2** if necessary and click **OK**.
54. Repeat steps 43 through 53 to add the means for the Perceived ratings and Desired ratings to the Ratings worksheet.

Use these procedures for the ratings for each institution. It is recommended that you place all of this data on the Ratings worksheet and organize it so it is easy to use.

Creating Charts

Once you have the descriptive data in the form of means and frequencies you can display it in a chart.

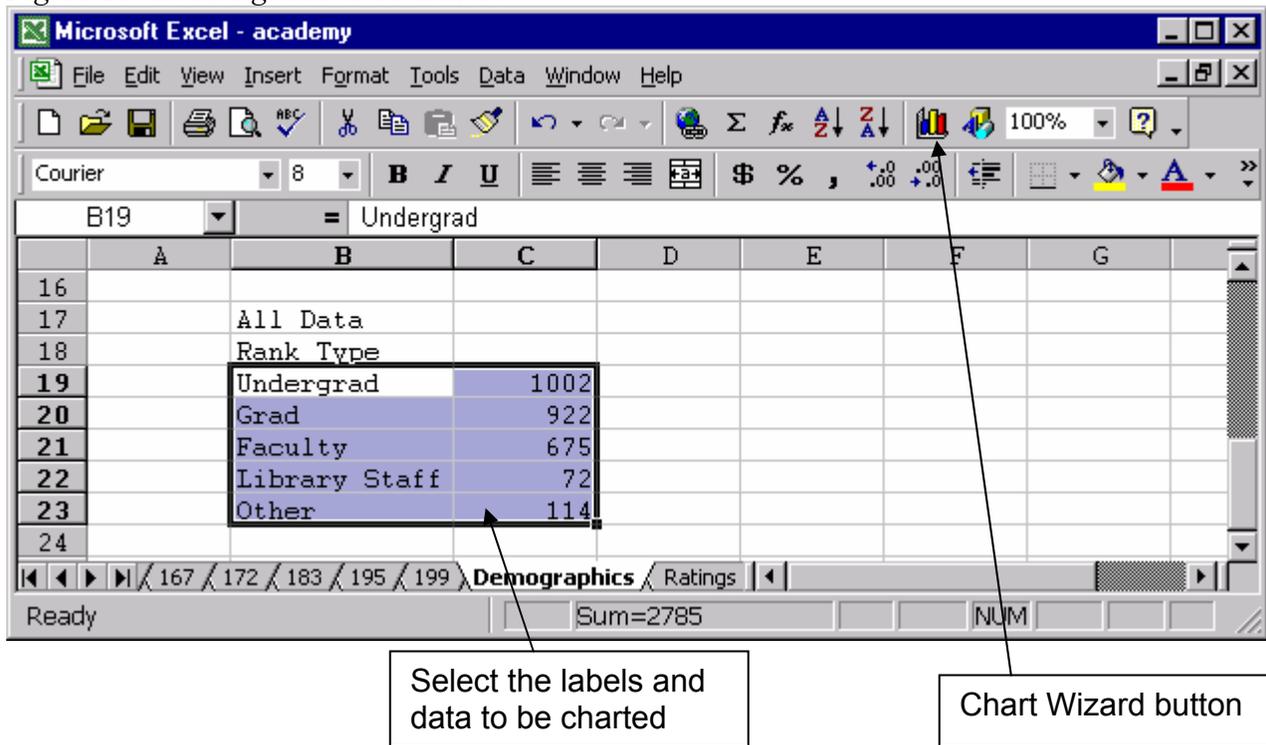
There are a number of ways to display your data in chart form. The type of chart you choose depends on what message you wish to convey and how easy it will be for your audience to understand. The rest of this handout will take you through the steps to display your data in the types of charts commonly used to display this type of information.

The next two sets of instructions will show how to create a pie chart and a bar chart of RANKTYPE data from the **All Data** tab. These instructions can be applied to any of the demographic data.

To create a pie chart from demographic information:

1. Select the cells containing data and labels you wish to chart.

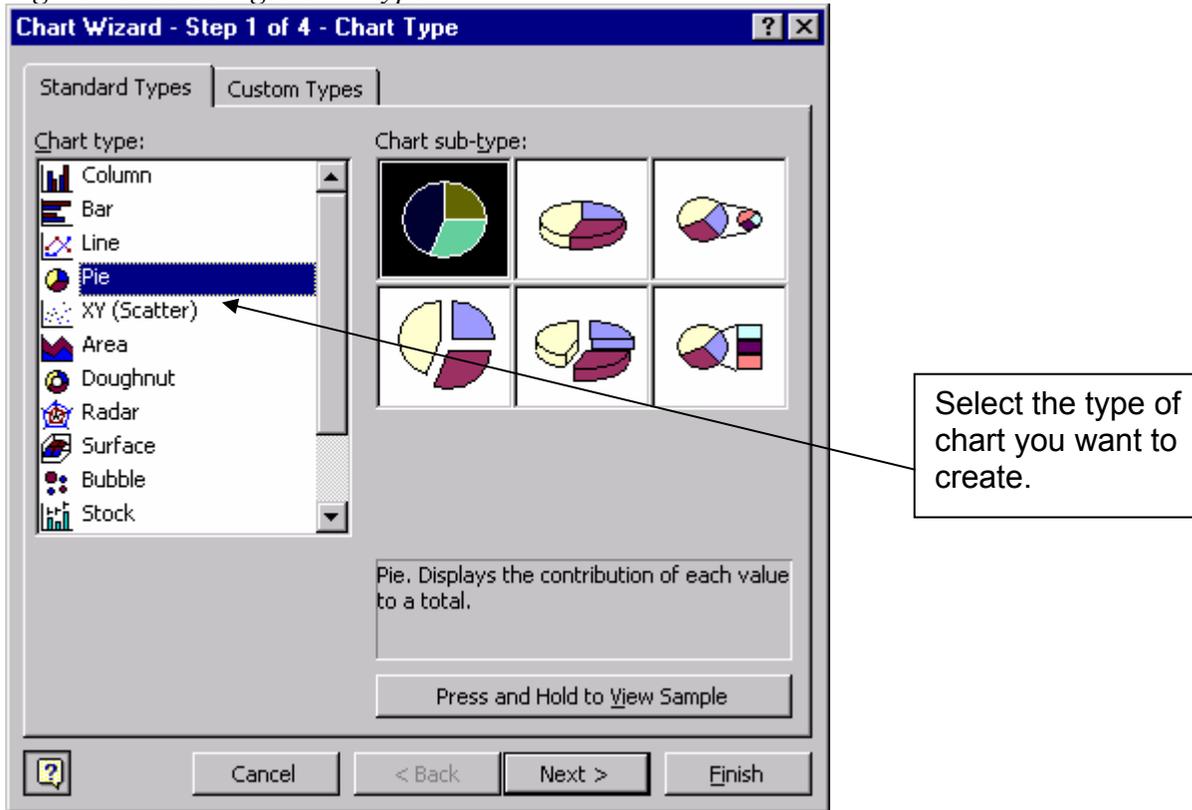
Figure 15: Selecting data to be charted



2. Click the **Chart Wizard** button on the toolbar.

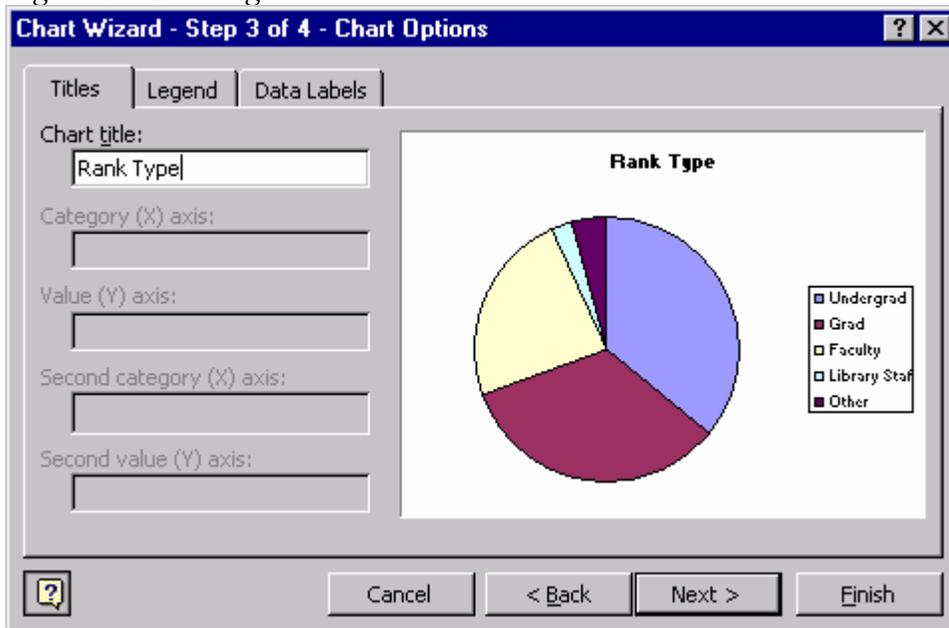
3. Click the type of chart you want. In this case we will choose **Pie** and click the **Next** button.

Figure 16: Selecting a chart type



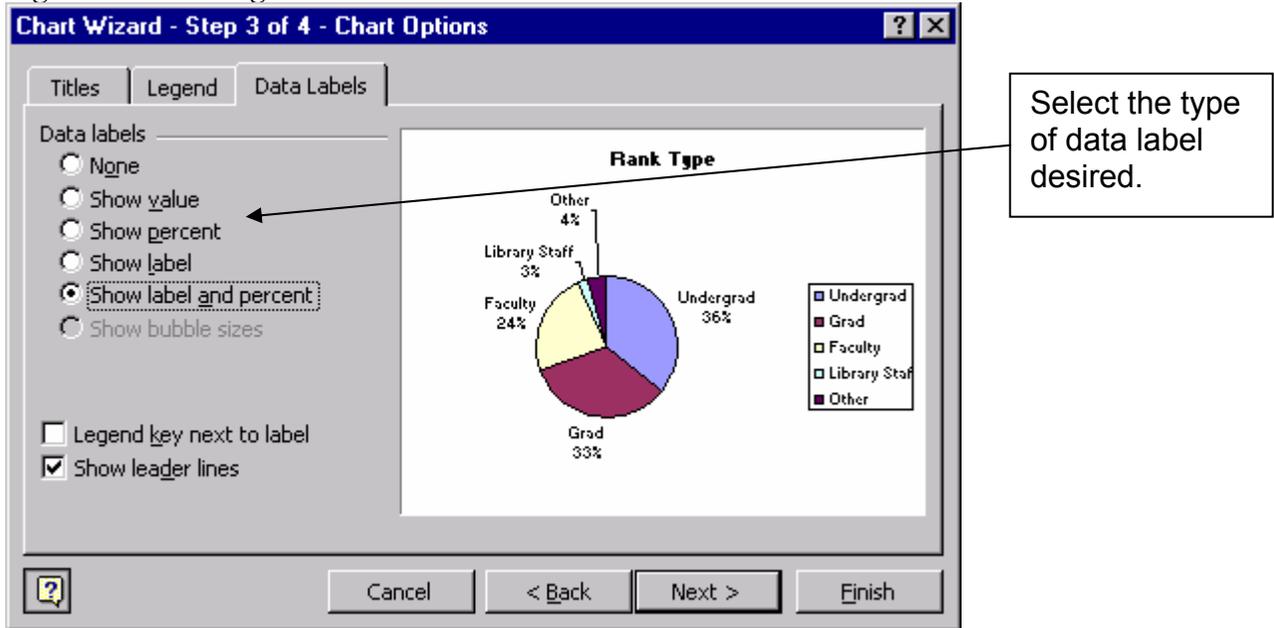
4. Click the **Next** button again.
5. Enter **Rank Type** in the **Chart title** box.

Figure 17: Entering a chart title



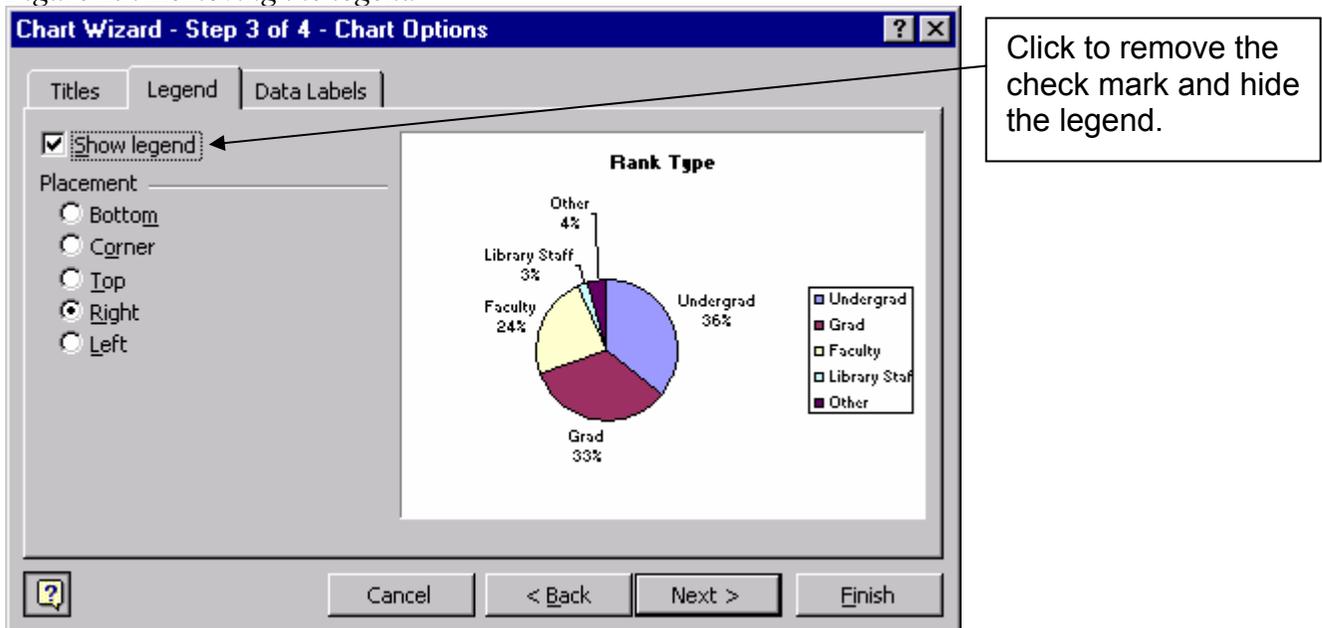
6. Click the **Data Labels** tab.
7. Select the **Data label type** you wish to use.

Figure 18: Selecting data labels



8. If you chose **Show label** or **Show label and percent** you can choose not to display the legend by clicking the **Legend** tab and clicking **Show legend** to deselect that option.

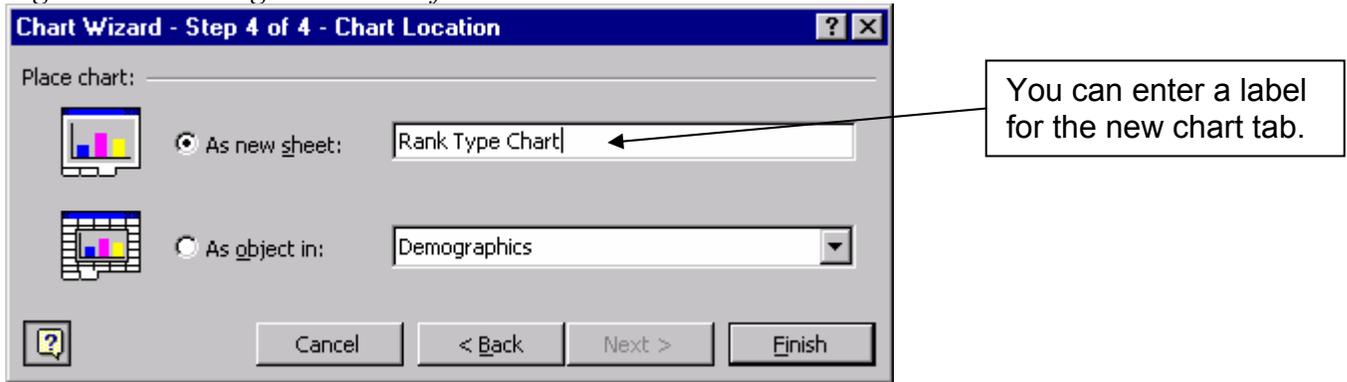
Figure 19: Removing the legend



9. Click **Next** after selecting the desired settings.

10. Select the chart location you desire. The **As new sheet** option will create a new sheet with its own tab. The new sheet will only contain the chart. You can enter a label for the sheet tab in the text box to the right of the option. The **As object in** option will create the chart on a regular worksheet. It can be the worksheet that contains the data depicted in the chart or you can select another worksheet from the drop-down list.

Figure 20: Selecting the location for the chart



11. Click **Finish** after making your selection.

To create a bar chart from demographic information:

1. Select the cells containing data and labels you wish to chart.
2. Click the **Chart Wizard** button on the toolbar.
3. In this case we will choose **Column** and click the **Next** button.
4. Select either **Rows** or **Column** to the right of **Series in**. As you click on either option a sample of how the chart will look will be displayed. This will help you select the option that works best for you.

Figure 21: Chart with the series in Row

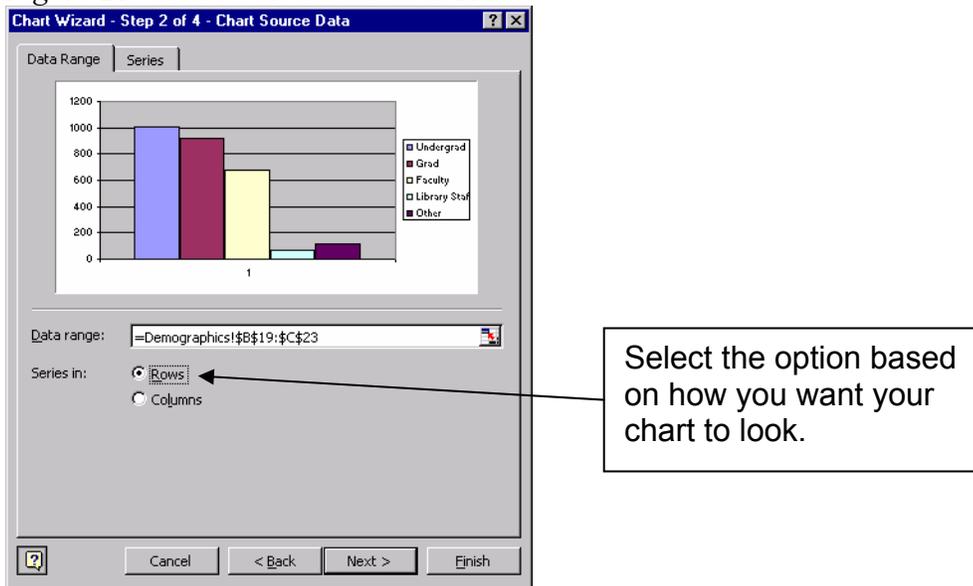
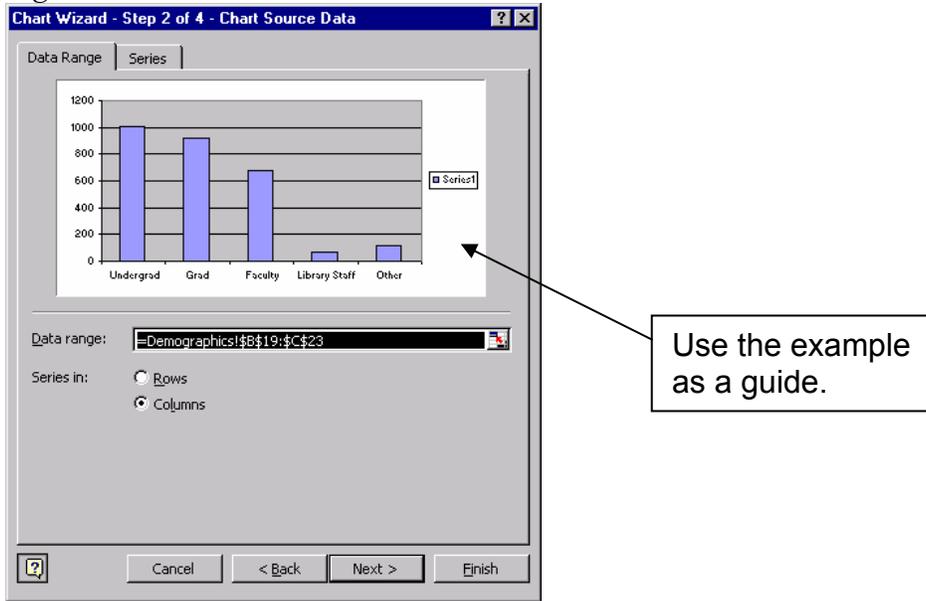


Figure 22: Chart with series in Column



5. Enter **Rank Type** in the Chart title box under the **Title** tab.
6. Go through each of the other tabs and select the settings you desire. As you change settings the sample display will change to help you select the settings you want.
7. Click **Next** after selecting the desired settings.
8. Select the chart location you desire. The **As new sheet** option will create a new sheet with its own tab. The new sheet will only contain the chart. You can enter a label for the sheet tab in the text box to the right of the option. The **As object in** option will create the chart on a regular worksheet. It can be the worksheet that contains the data depicted in the chart or you can select another worksheet from the drop-down list.
9. Click **Finish** after making your selection.

After you have gone through the **Chart Wizard** you can apply additional settings or change any of the settings you have already selected. Just right-click on any part of the chart you wish to change and choose an option from the pop up menu. For example, if you chose to show percentages to label your pie chart and you wish to show the percentage to two decimal places you can easily do that. Just right-click on any of the percentage labels and select **Format Data Labels**. Click the **Number** tab. **Percentage** should already be selected as the category. Change the **Decimal places** to 2 and click **OK**. If you wish to change the font of the labels on the X-axis of your bar chart, just right click on one of the X-axis labels and select **Format Axis**. Click the **Font** tab and select the setting you want. There are many settings you can apply so it may take time to find the setting to get the look you want for your chart. Just keep experimenting.

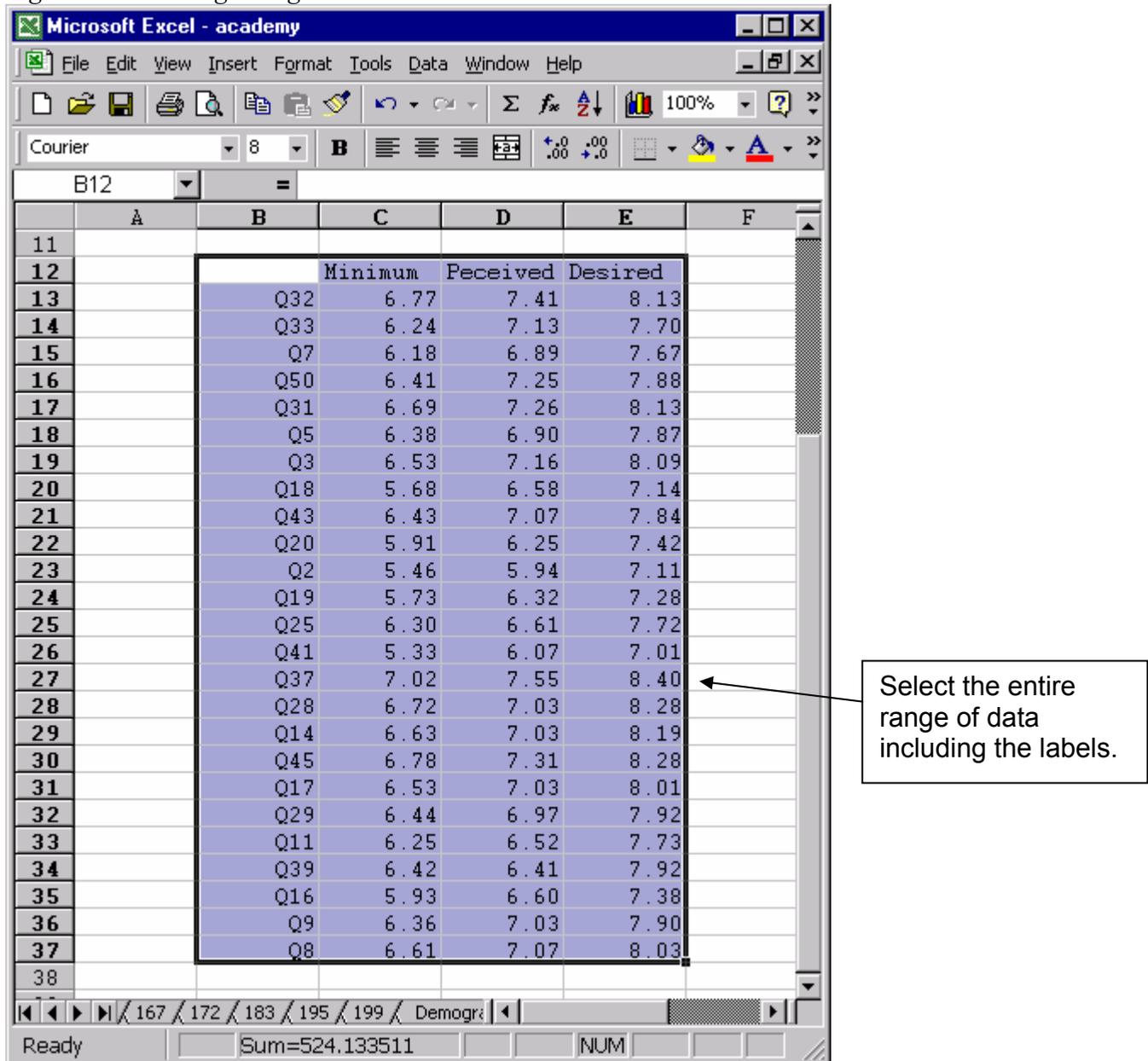
Creating a Radar Chart for your Ratings Data

A radar chart has most often been used to show the relationships between the Minimum, Perceived and Desired ratings in the survey.

To create a *radar graph*:

1. Select the cell range of the information you wish to display on your chart including the column labels (Minimum, Perceived, and Desired), the labels for the questions (Q32...Q8), and the means.

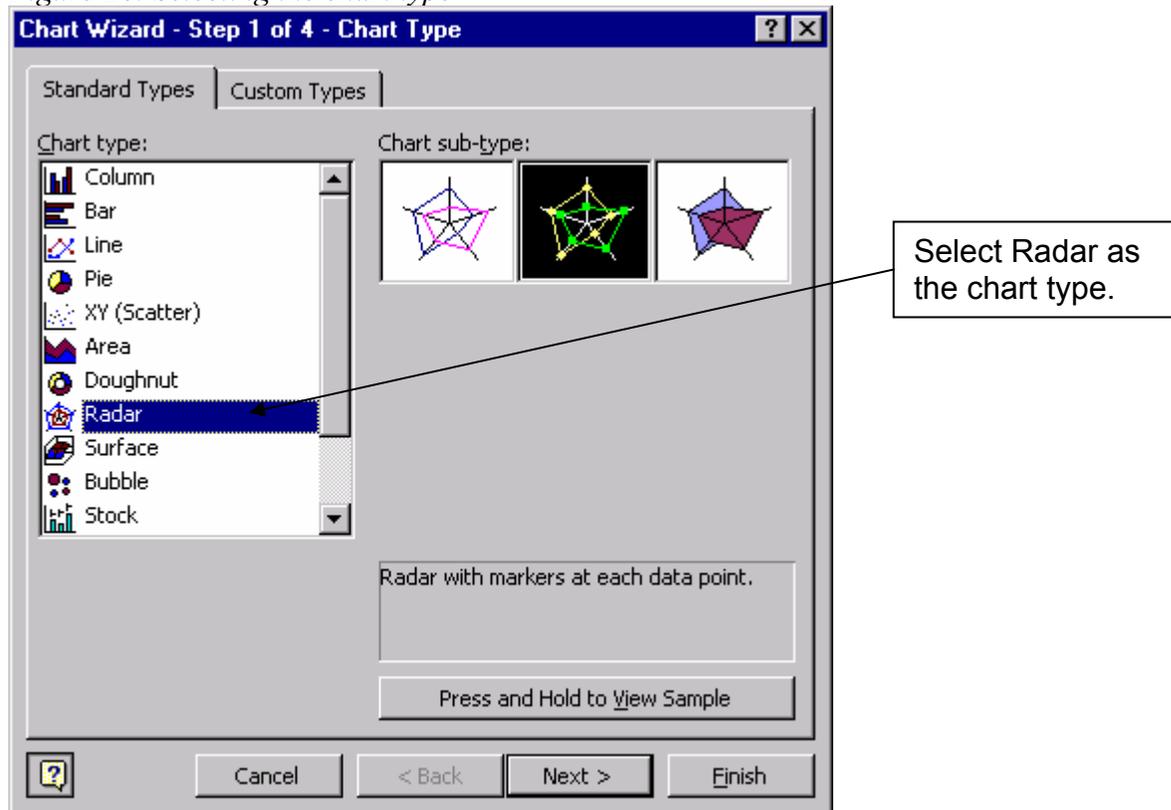
Figure 23: Selecting ratings data



2. Click the **Chart Wizard** button in the toolbar.

3. Select **Radar** as the **Chart Type**.

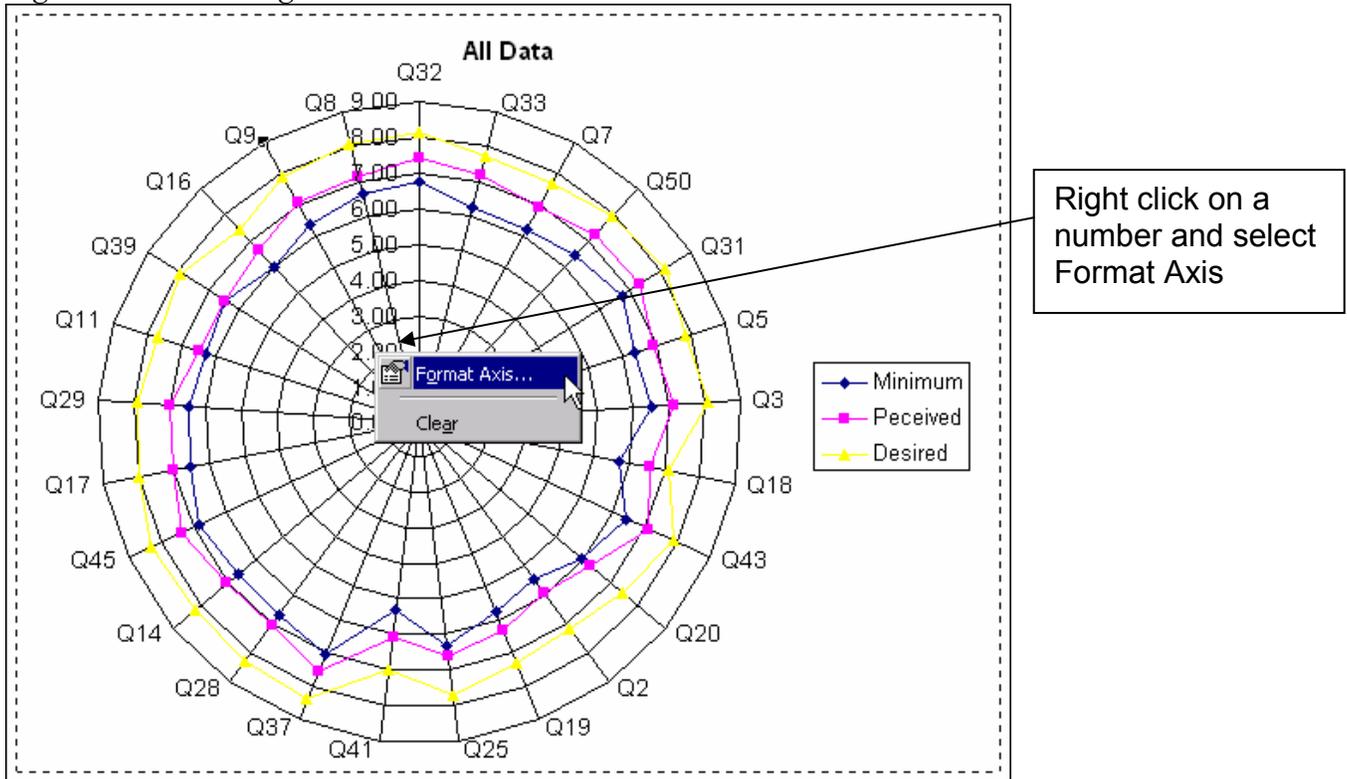
Figure 24: Selecting the chart type



4. Click the **Next** button.
5. Click **Next** again.
6. Enter a title for the chart in the **Chart title** box under the **Title** tab.
7. Click **Next**.
8. Choose to create the chart as a new sheet or on an existing worksheet.
9. Click **Finish**.

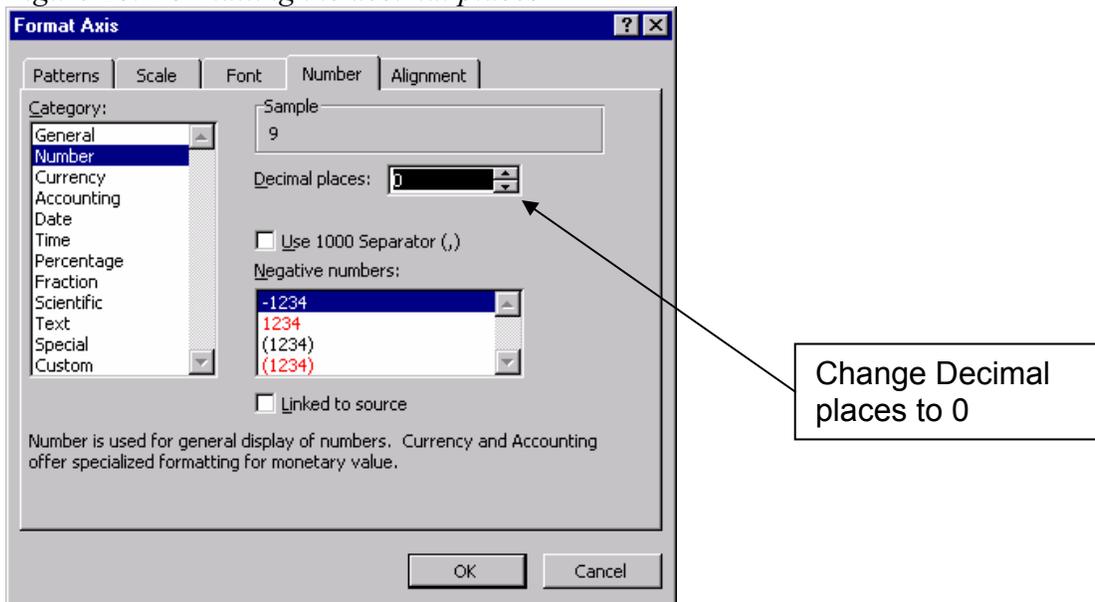
10. Right-click one of the numbers running from the middle of the circle to the top edge of the circle. These are the labels for the circles of the chart. We are going to reformat them a little.
11. Select **Format Axis**.

Figure 25: Formatting axis labels



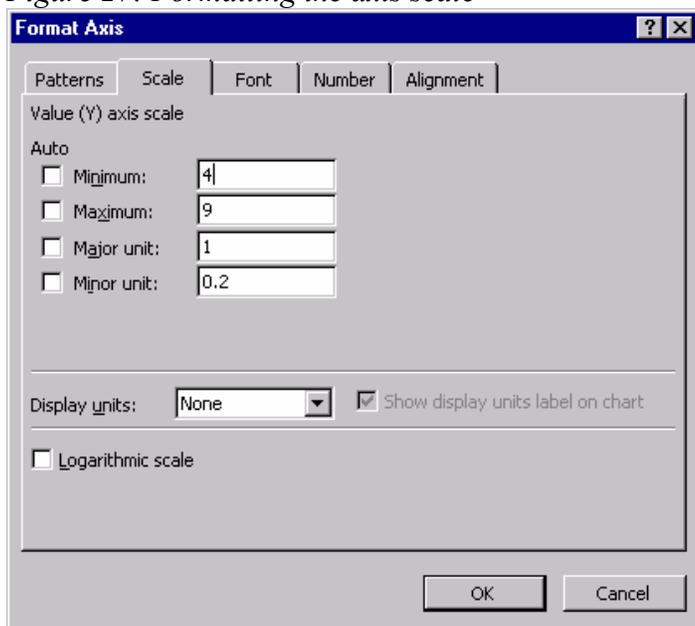
12. Under the **Number** tab change the **Decimal places** to **0**.

Figure 26: Formatting the decimal places



13. Under the **Scale** tab uncheck all of the check marks under **Auto**.
14. Enter **4** as the **Minimum** value, **9** as the **Maximum** value, and **1** as the **Major unit**.

Figure 27: Formatting the axis scale



15. Click **OK**.

As with other charts you can right-click on different parts of it to change display settings.

Charting More Specific Data

The charts that have been describes so far describe the data in broad strokes, so to speak. What if you want more specific information? What if you want create a chart that shows the differences in OVERALLS ratings by the age of the participants? Again, you have to set up the data.

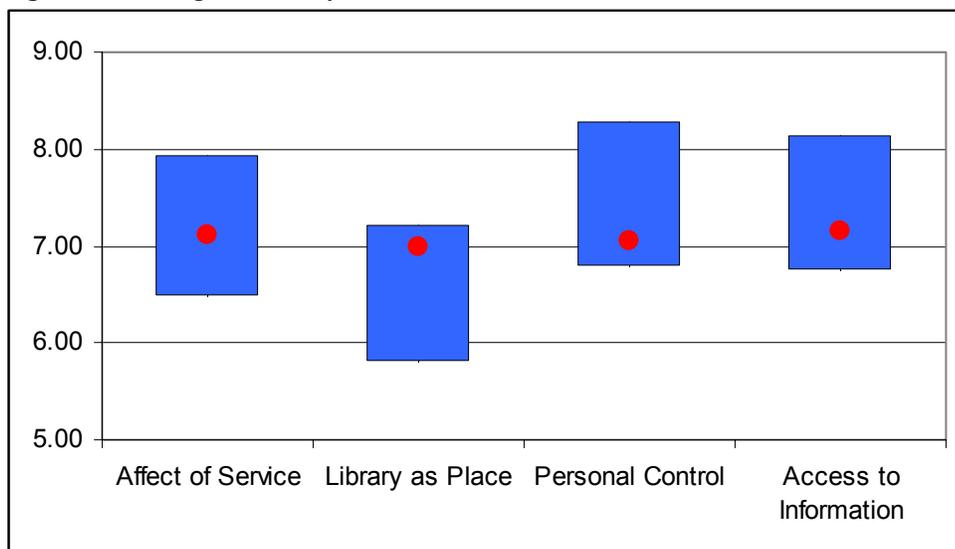
Using the example of charting OVERALLS ratings by age:

1. Group the data into sets by age.
 - a. Click in a cell in the **AGE** column.
 - b. Click the **Sort Ascending** button on the toolbar.
2. Select the range of data based on cells that have the same number in the AGE column then copy and paste in somewhere separate. This is basically the same thing as grouping the data into sets by institution.
3. Repeat step 2 for each AGE range.
4. Use the AVERAGE function to find the mean for the OVERALLS rating for each different AGE.
5. Copy and paste each mean next to its label so they are all together in a separate area.
6. Select the range containing the labels and means then click the Chart Wizard button.
7. Go through the steps in the Chart Wizard to create the chart.
8. Edit the chart as needed.

Charting the Zone of Tolerance

The following instructions are designed to help you chart the zones of tolerance for the different dimensions in the LibQUAL+ study. The resulting chart will resemble the one in Figure 28 below.

Figure 28: Sample Zone of Tolerance Chart



The blue bar represents the zone of tolerance for its dimension. The top of the blue bar represents the mean score for Desired. The bottom of the blue bar represents the mean score for Minimum. The red circle represents the mean for Perceived.

The chart does not look exactly like the ones in the survey results reports, but it is the closest that can be created using Microsoft Excel and it conveys the same information.

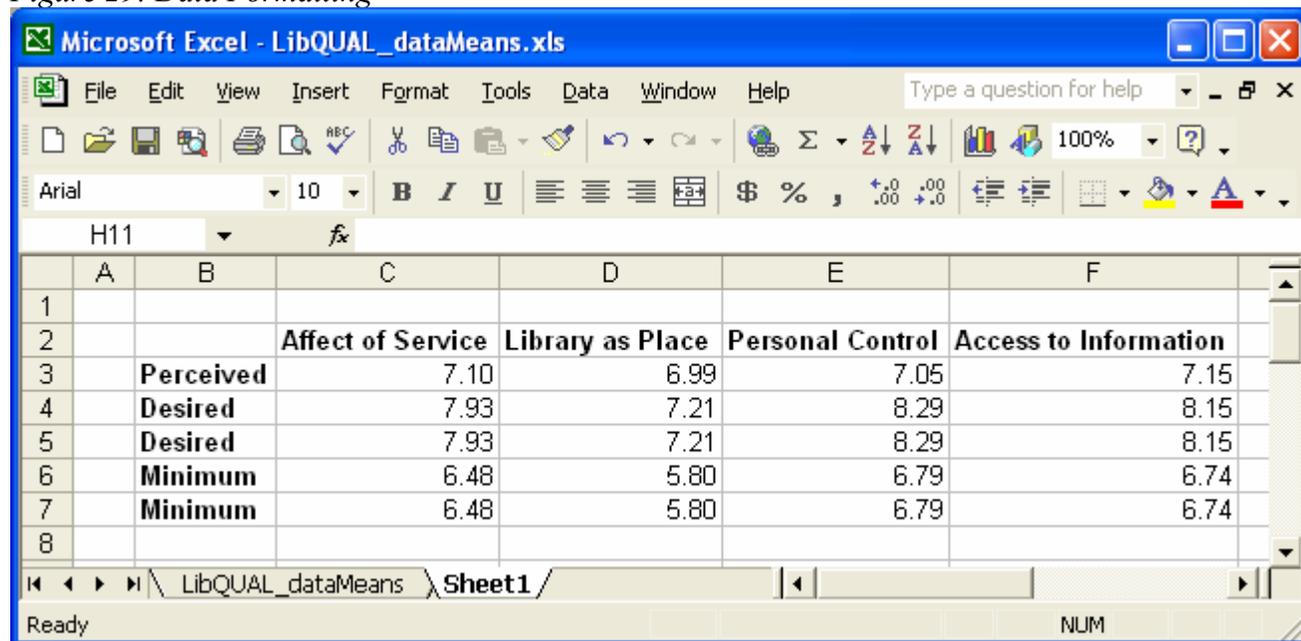
The example used in these instructions is based on the four dimensions in the 2003 version of LibQUAL+. The 2004 version, for example, only uses 3 dimensions, but the process will essentially be the same. These instructions can also be used to chart the means of individual questions or other combinations of questions

The instructions are based on using Excel 2002 running on Windows XP. However, the same instructions can be followed in Excel 97 or higher.

The data for the example used in the instructions were retrieved using the Interactive Statistics feature in the Survey Results area of the LibQUAL+™ Web site.

1. Format the data you wish to chart in the following format:

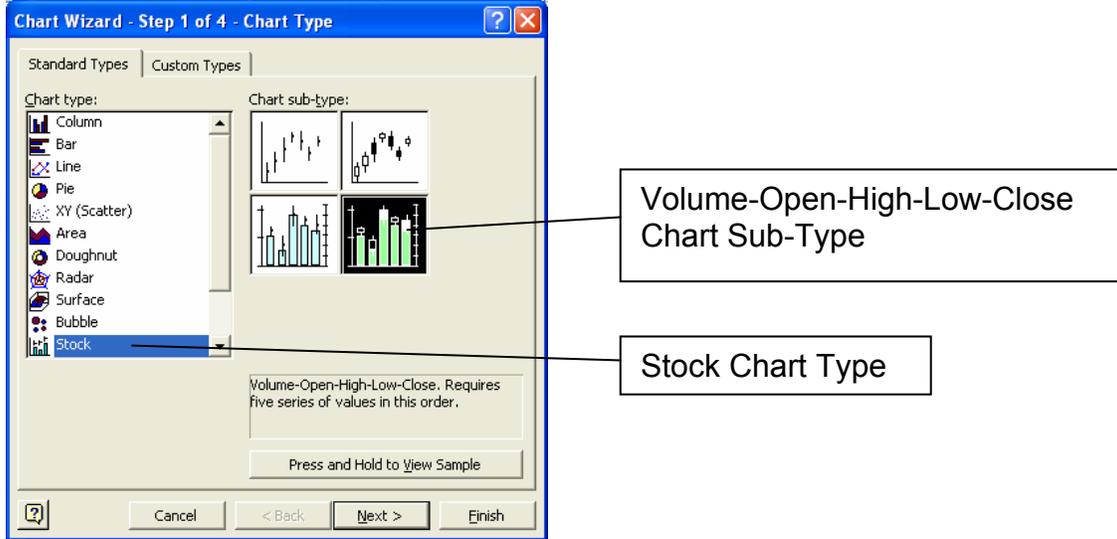
Figure 29: Data Formatting



Note the order which the means are displayed. In each column, the mean for Perceived is listed first, the mean for Desired is listed **twice** below that, and the mean for Minimum is listed **twice** below that. The means for Desired and Minimum are listed twice because Microsoft Excel does not have a built in chart type for the kind of chart you need. We will be adapting a Stock chart that uses 5 data elements per column.

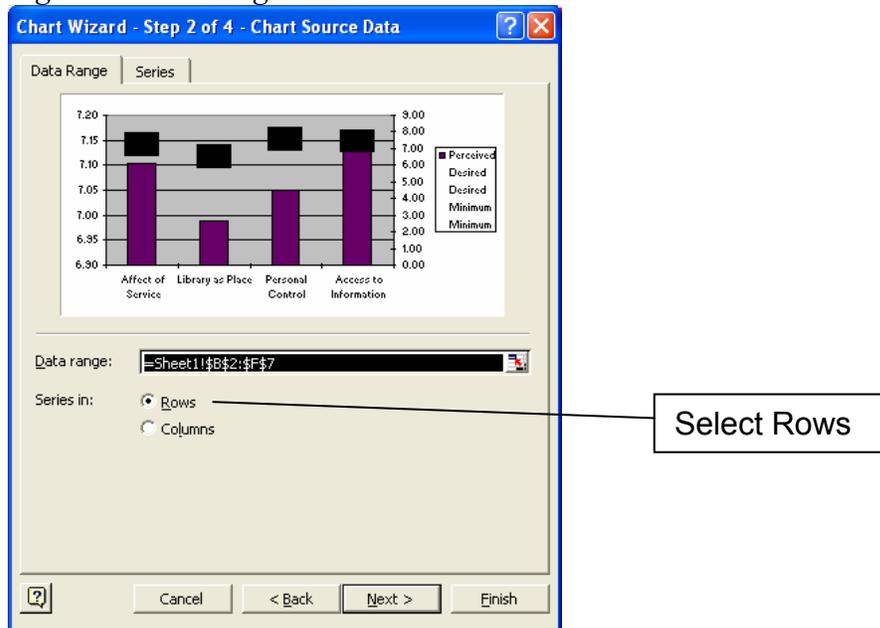
2. Select the data you wish to chart, including the labels for the rows and columns. (In the example above it would be cells B2 through F7.)
3. Click the **Chart Wizard** button on the toolbar. 
4. Select **Stock** as the Chart type and **Volume-Open-High-Low-Close** as the Chart sub-type, and then click the **Next** button.

Figure 30: Selecting Chart Type and Chart Sub-Type



5. Click **Rows** to the right of “Series in:” under the Data Range tab and then click **Next**.

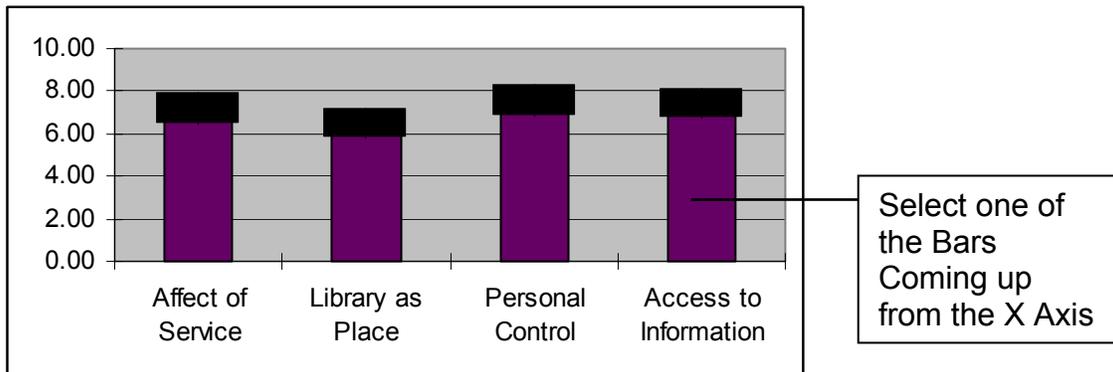
Figure 31: Selecting the Source Data



6. Enter values for the **Chart title**, **Category (x) axis**, and **Value (y) axis** if desired under the Titles tab on step 3 of the Chart Wizard.
7. Click the **Axes** tab and uncheck **Value (Y) axis** under **Secondary axis**.
8. Click the **Legend** tab and uncheck **Show legend** and then click the **Next** button.
9. Select whether you want the chart to appear on a new sheet or on the current sheet with the data and then click **Finish**. The chart should resemble the one in Figure 32.

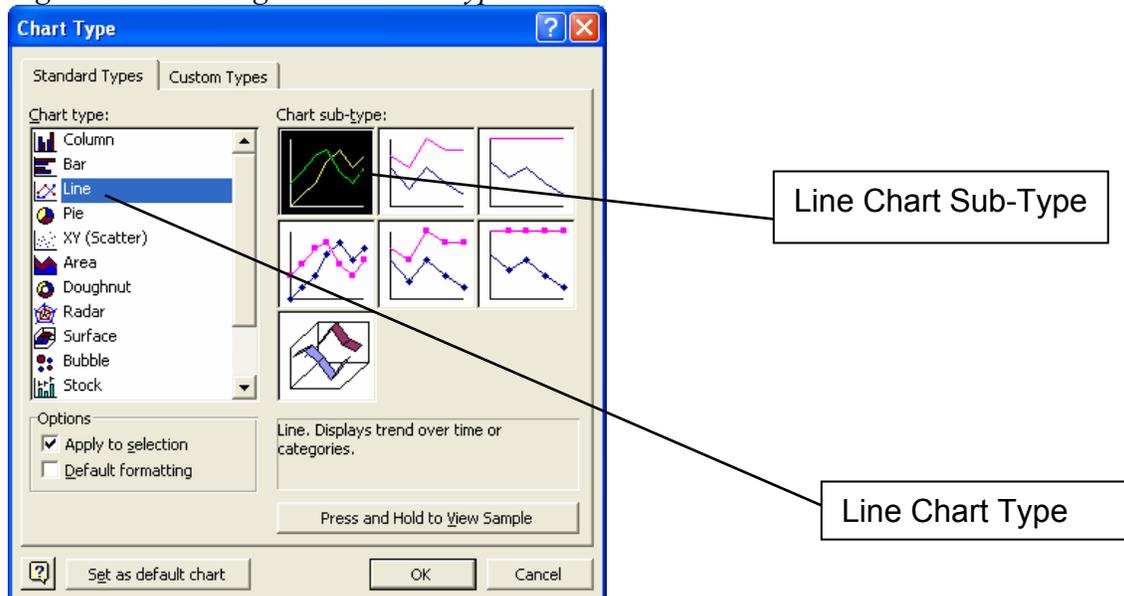
- In the chart, click one of the bars that come up from the X axis, which in this case represent the mean Perceived scores.

Figure 32: Select the Perceived Score Bar



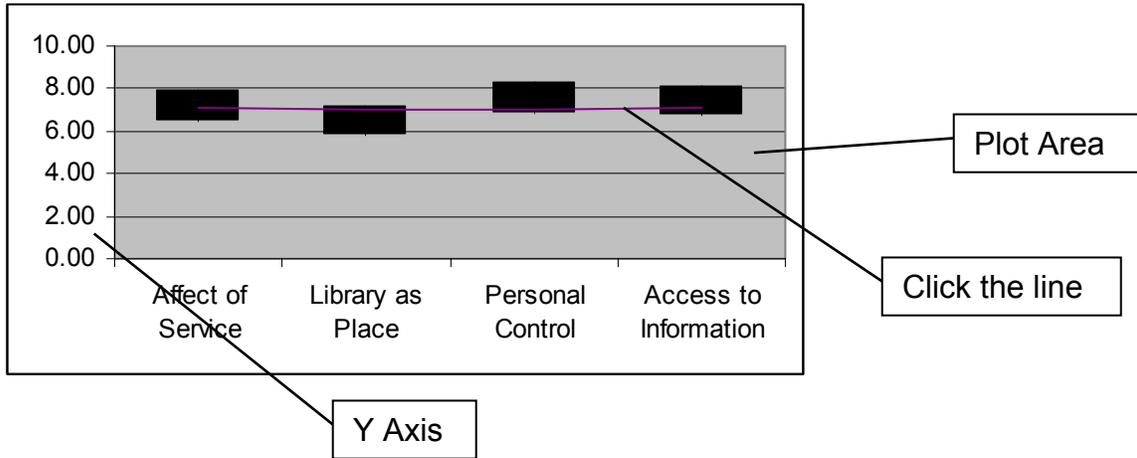
- Click the **Chart** menu (not the Chart toolbar) and then select **Chart Type**.
- Select **Line** as the Chart type and **Line** as the Chart sub-type and then click OK.

Figure 33: Selecting a New Chart Type



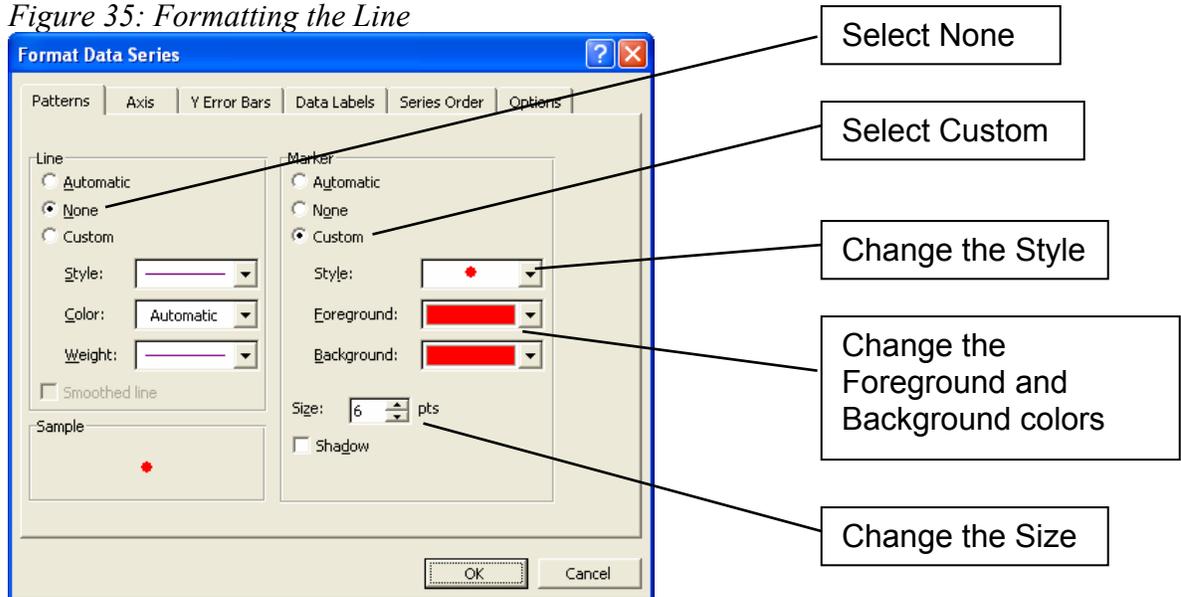
- On the chart, click the line that was just created.

Figure 34: Select the Line



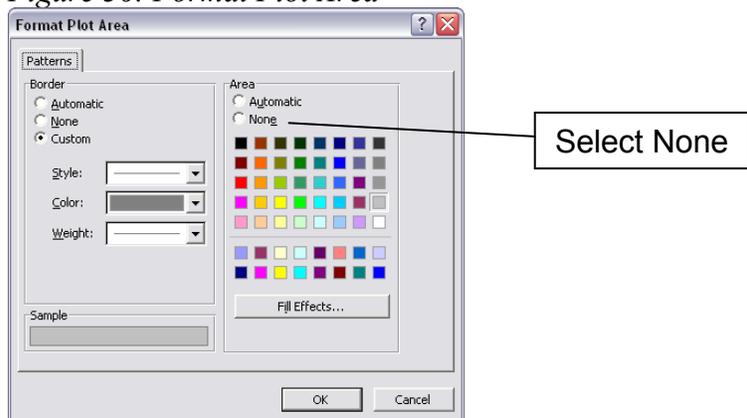
- Click the **Format** menu and then select **Selected Data Series**.
- Select **None** under Line and select **Custom** under Marker.
- In the Marker area, select a **Style**, such as a circle, a **Foreground** and **Background** color, such as red, and change the **Size** to about 6 or 7 pts, and then click **OK**.

Figure 35: Formatting the Line



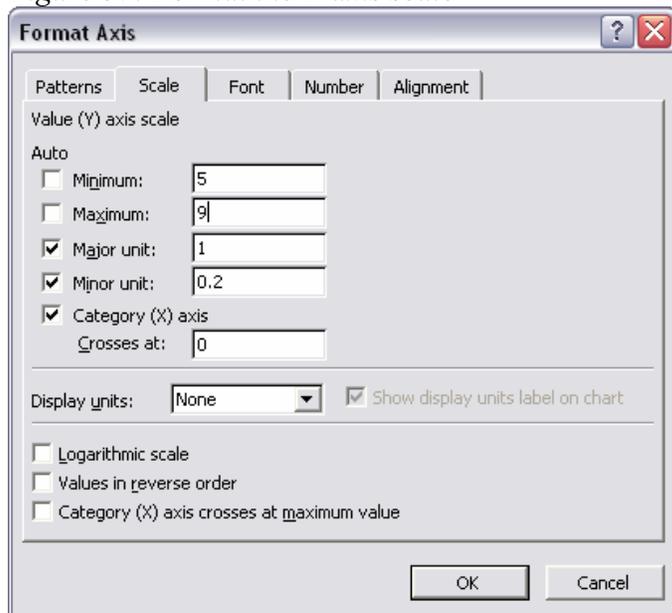
17. Right-click within the gray Plot Area, and then select **Format Plot Area**.

Figure 36: Format Plot Area



18. Select **None** in the Area section, and then click **OK**.
19. Right-click the values on the **Y-axis**, and then select **Format Axis**.
20. Click the **Scale** tab.
21. Enter **5** for the **Minimum** (or 4 if the lowest mean for Minimum is less than 5), enter **9** for **Maximum** (even if it already has a 9), enter 1 for the **Major unit**, and then click **OK**.

Figure 37: Format the Y-axis scale

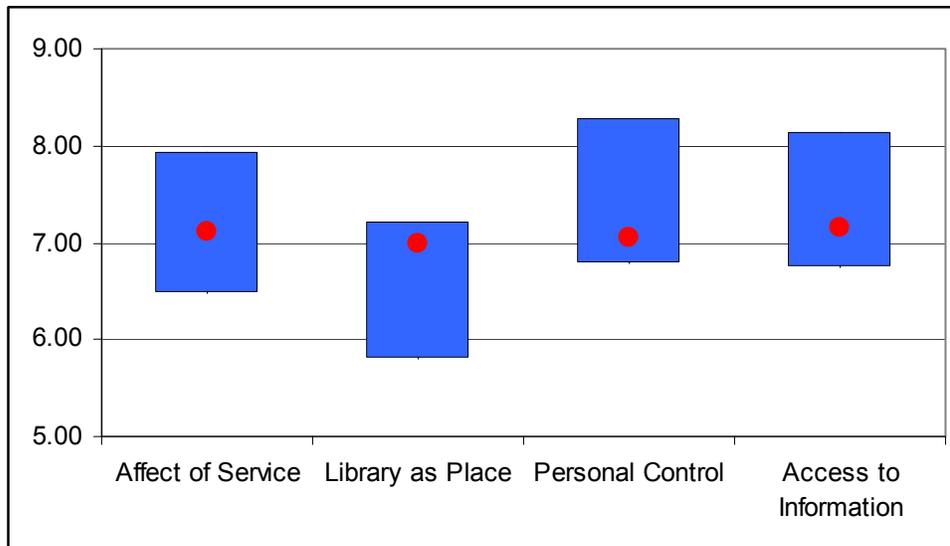


22. Right-click one of the bars representing the range between Minimum and Desired scores and then select **Format Down Bars**.

23. Select a color you prefer for the bars under Area and then click **OK**.

That's it. Your chart should look something like Figure 38.

Figure 38: Finished Chart



Now that you have created this custom chart, you can save it as a Chart Type. This will save you from the customization process every time you want to create the chart.

1. Click the customized chart to select it.
2. Click the **Chart** menu and then click **Chart Type**.
3. Click the **Custom Types** tab at the top of the window.
4. Click **User-defined** near the bottom left corner of the window.
5. Click the **Add** button.
6. Enter a name for the custom chart type and then click **OK**.

When you want to create a new chart using your new custom chart type:

1. Format your data, select the data to be charted, and then click the Chart Wizard button. (Steps 1-3 in the instructions for creating the chart.)
2. In the Chart Wizard, click the **Custom Types** tab.
3. Click **User-defined** near the bottom left corner of the window.
4. Click the name of the custom chart type you created.
5. Click the **Next** button.
6. Click **Rows** under the Data Range tab.
7. Enter titles if you'd like.
8. Click the **Next** button.
9. Select whether you want the chart on a new sheet or on the same sheet as the data.
10. Click the **Finish** button.

One of the most important parts of charting your data is setting it up first. You have to isolate the data you are interested in. Perform calculations to get descriptive data such as means and frequencies. Organize and label the descriptive data so it can be easily selected in a range. Then just use the Chart Wizard.