Likert Plot

statgraphics 18®
centurion

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Summary

The **Likert Plot** procedure analyzes data recorded on a Likert scale. Likert scales are commonly used in survey research to record user responses to a statement. A typical 5-level Likert scale might code user responses according to:

1 = Strongly disagree
2 = Disagree
3 = No opinion
4 = Agree
5 = Strongly agree

This analysis calculates summary statistics and displays the results using a diverging stacked barchart.

Sample StatFolio: *likert.sgp*

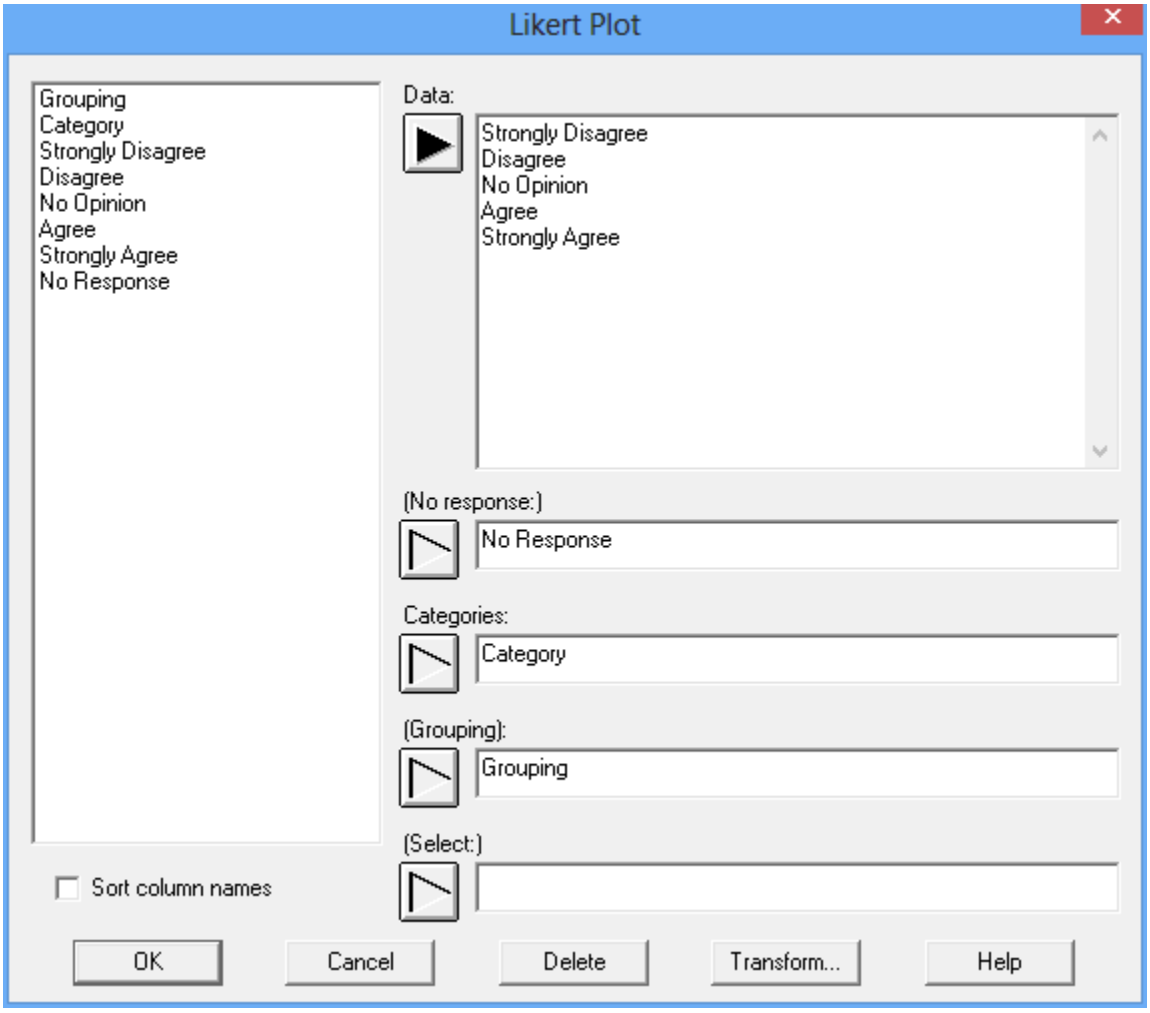
Sample Data

The file *likert.sgd* contains data from a survey of members of the American Statistical Association, reported in Robbins and Heiberger (2011). Members were asked whether they agreed that their primary position is professionally challenging. Responses were recorded using the 5-level Likert scale shown above. The table below shows the results:

Grouping	*Category*	*Strongly Disagree*	*Disagree*	*No opinion*	*Agree*	*Strongly Agree*	*No Response*
Employment sector	Academic	0	5	8	78	162	0
Employment sector	Business and industry	0	11	5	88	72	0
Employment sector	Government	2	3	5	34	27	0
Employment sector	Private consultant	0	0	2	15	11	0
Employment sector	Other	2	2	5	15	10	0
Race	White	4	11	18	167	200	0
Race	Asian	0	4	4	49	65	0
Race	Black or African American	0	1	2	3	4	0
Race	Other	0	2	1	6	8	0
Education	Associate's and Bachelor's	2	12	10	86	65	0
Education	Master's and Above	2	9	17	143	217	0
Gender	Male	3	12	15	146	180	0
Gender	Female	1	7	12	78	102	0

Data Input

The data to be analyzed consists of the number of responses at each level of the Likert scale. It is entered on the dialog box shown below:



- **Data:** numeric columns containing counts, one column for each level of the Likert scale.
- **No response:** optional column containing the number of non-responses to the question. If included, the percentages displayed will take this column into account.
- **Categories:** column defining the labels for each row. This may be used to divide respondents into groups, or to identify different questions.
- **Grouping:** optional column used to group the categories.
- **Select:** subset selection.

Analysis Summary

The *Analysis Summary* displays the percentage breakdowns for each row:

Likert Plot

Grouping	*Category*	*Total count*	*Strongly disagree (1)*	*Disagree (2)*	*No Opinion (3)*	*Agree (4)*	*Strongly Agree (5)*	*No Response*
Employment sector	Academic	253	0.00%	1.98%	3.16%	30.83%	64.03%	0.00%
Employment sector	Business and industry	176	0.00%	6.25%	2.84%	50.00%	40.91%	0.00%
Employment sector	Government	71	2.82%	4.23%	7.04%	47.89%	38.03%	0.00%
Employment sector	Private consultant	28	0.00%	0.00%	7.14%	53.57%	39.29%	0.00%
Employment sector	Other	34	5.88%	5.88%	14.71%	44.12%	29.41%	0.00%
Race	White	400	1.00%	2.75%	4.50%	41.75%	50.00%	0.00%
Race	Asian	122	0.00%	3.28%	3.28%	40.16%	53.28%	0.00%
Race	Black or African American	10	0.00%	10.00%	20.00%	30.00%	40.00%	0.00%
Race	Other	17	0.00%	11.76%	5.88%	35.29%	47.06%	0.00%
Education	Associate's and Bachelor's	175	1.14%	6.86%	5.71%	49.14%	37.14%	0.00%
Education	Master's and Above	388	0.52%	2.32%	4.38%	36.86%	55.93%	0.00%
Gender	Male	356	0.84%	3.37%	4.21%	41.01%	50.56%	0.00%
Gender	Female	200	0.50%	3.50%	6.00%	39.00%	51.00%	0.00%

The output includes:

- **Total count** - the number of respondents in each row, including those that made no response.
- **Percentages** – percentage distribution across all columns of the Likert scale and the “no response” column, if supplied.

Summary Statistics

The *Summary Statistics* pane displays statistics for each row:

Summary Statistics

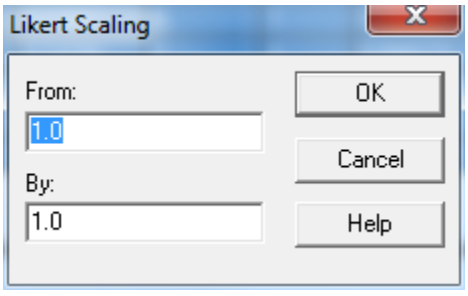
Grouping	*Category*	*Count*	*Mean*	*Median*	*Mode*	*Std. deviation*
Employment sector	Academic	253	4.56917	5	5	0.653478
Employment sector	Business and industry	176	4.25568	4	4	0.78875
Employment sector	Government	71	4.14085	4	4	0.923798
Employment sector	Private consultant	28	4.32143	4	4	0.600807
Employment sector	Other	34	3.85294	4	4	1.08824
Race	White	400	4.37	4.5	5	0.779808
Race	Asian	122	4.43443	5	5	0.712738
Race	Black or African American	10	4.0	4	5	1.0
Race	Other	17	4.17647	4	5	0.984306
Education	Associate's and Bachelor's	175	4.14286	4	4	0.886175
Education	Master's and Above	388	4.45361	5	5	0.732467
Gender	Male	356	4.37079	5	5	0.788
Gender	Female	200	4.365	5	5	0.788527

The output includes:

- **Count** - the number of respondents in each row, excluding those that made no response.
- **Mean, median and mode** – measures of central tendency.
- **Standard deviation** – measure of dispersion.

Analysis Options

The numeric values assigned to the levels of the Likert scale when calculating the summary statistics are specified on the *Analysis Options* dialog box:

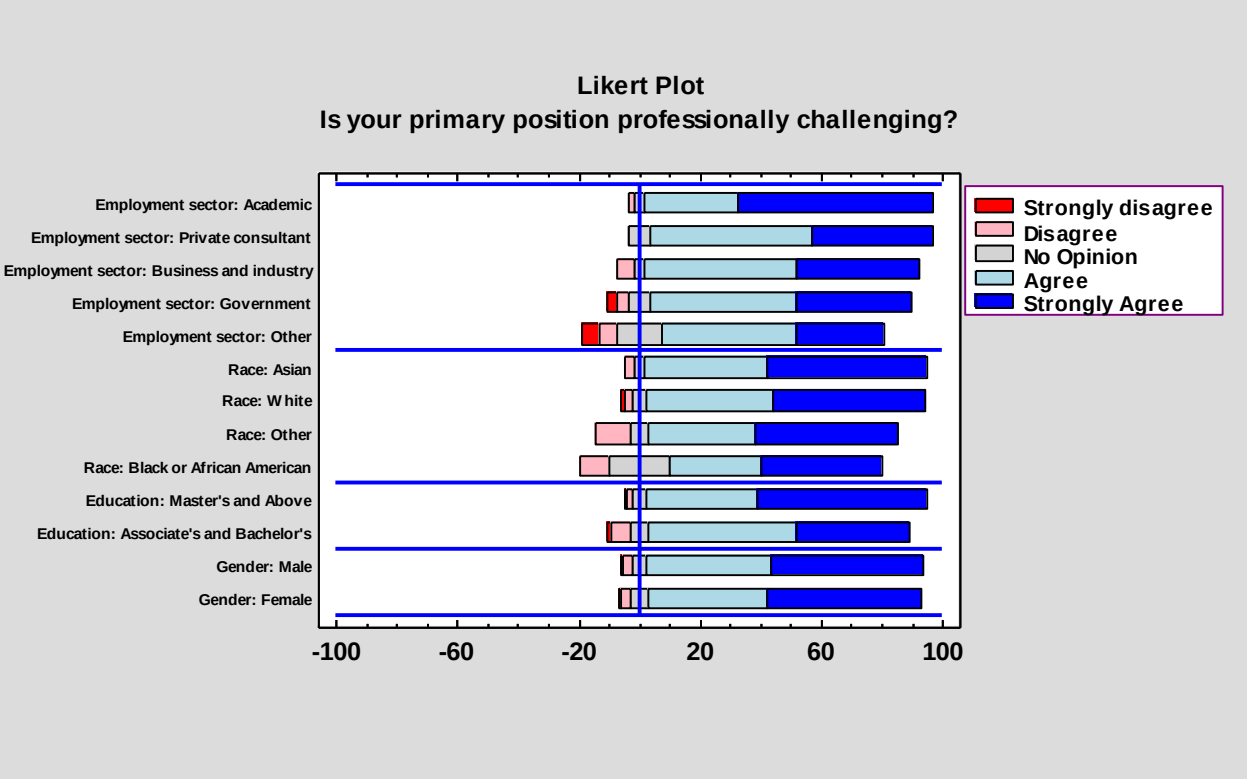


- **From:** value assigned to the first level.
- **By:** increment between levels (may be negative).

The dialog box above defines the values as 1, 2, 3, 4, and 5.

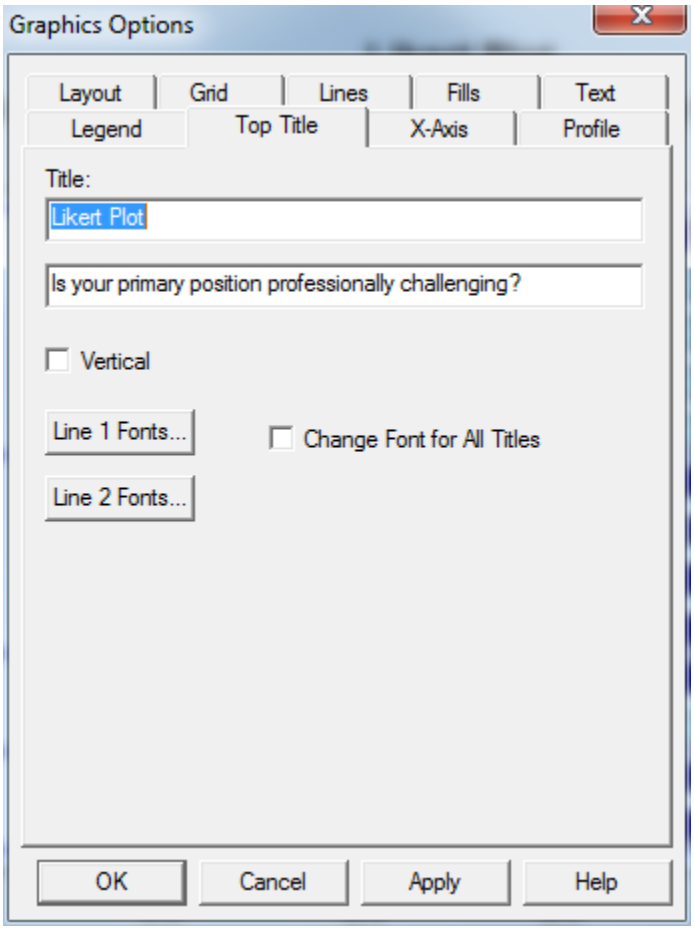
Likert Plot

This plot displays the percentages using a diverging stacked barchart:

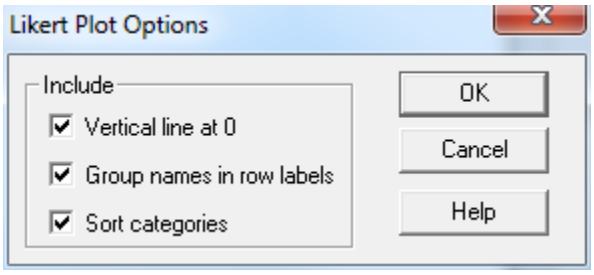


There is a single bar for each row, showing the percentage distribution across levels of the Likert scale. Each bar is aligned so that the center of the Likert scale is at 0 on the horizontal axis. For the selected scale, bars extending farther to the right than to the left show general agreement with the statement, while bars extending farther to the left show general disagreement.

Note: The *Graphics Options* dialog box has been used to change the default fill colors using the *Fills* tab, while the *Top Title* tab has been used to add the question to the title:



Pane Options



- **Vertical line at 0**: if checked, a vertical line is added to the plot at 0 on the horizontal axis.
- **Group names in row labels**: if checked, group names are added to the category labels.
- **Sort categories**: if selected, the bars are sorted within each group in descending order of their means.

References

Robbins and Heiberger (2011). “Plotting Likert and Other Rating Scales.” Proceedings of the Section on Survey Research Methods, JSM 2011.