

Bar charts

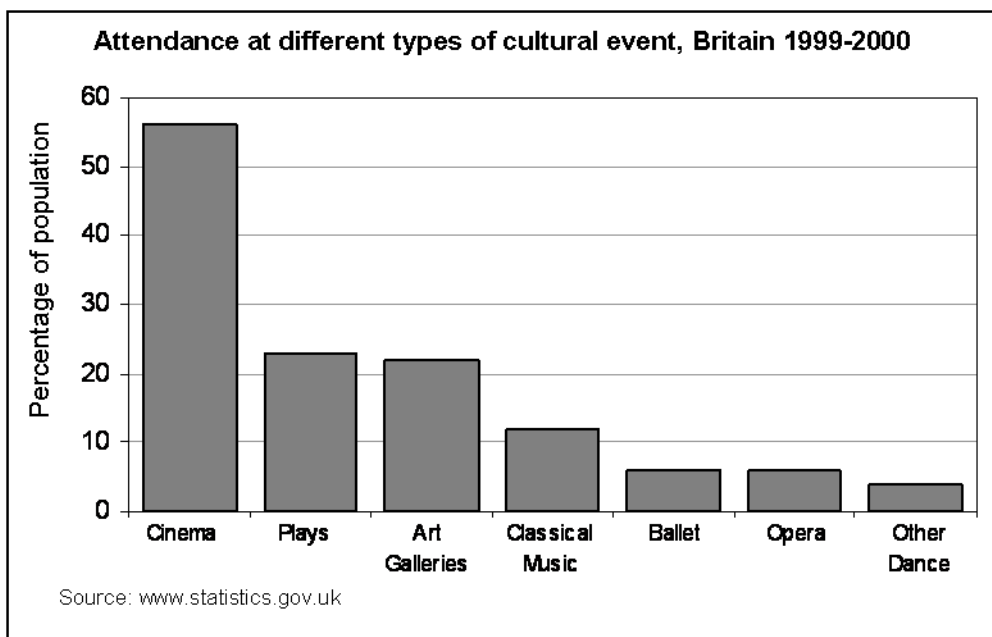
This guide explains what bar charts are and outlines the different ways in which they can be used to present data. It also provides some design tips to ensure that when you use bar charts to present data they are clear and easy to interpret.

Other useful guides from Student Learning Development: *Histograms, Pie charts, Presenting numerical data*

What is a bar chart?

Bar charts are a type of graph that are used to display and compare the number, frequency or other measure (e.g. mean) for different discrete categories of data. In the example below, which shows the percentage of the British population who attended different types of cultural events during 1999-2000, the types of event are the discrete categories of data.

Bar charts are one of the most commonly used types of graph because they are simple to create and very easy to interpret. They are also a flexible chart type and there are several variations of the standard bar chart including horizontal bar charts, grouped or component charts, and stacked bar charts.

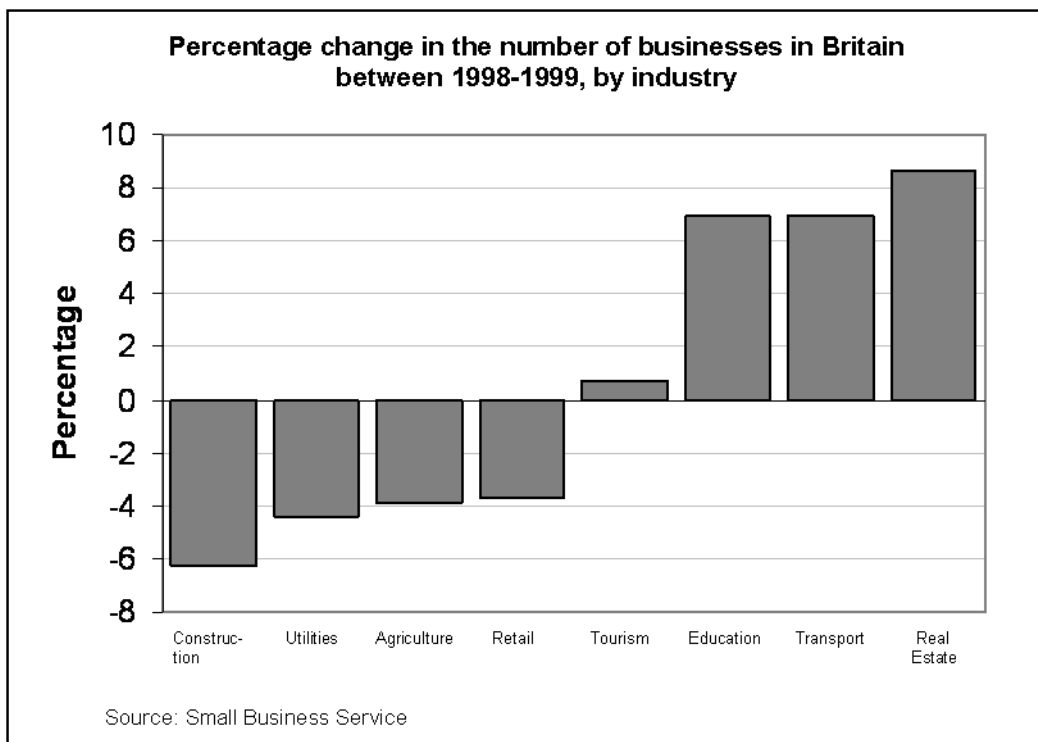


The chart is constructed such that the lengths of the different bars are proportional to the size of the category they represent. The x-axis represents the different categories and so has no scale. In order to emphasise the fact that the categories are discrete, a gap is left between the bars on the x-axis. The y-axis does have a scale and this indicates the units of measurement.

What types of data can be displayed using a bar chart?

Bar charts are useful for displaying data that are classified into nominal or ordinal categories. Nominal data are categorised according to descriptive or qualitative information such as county of birth, or subject studied at university. Ordinal data are similar but the different categories can also be ranked, for example in a survey people may be asked to say whether they thought something was very poor, poor, fair, good or very good.

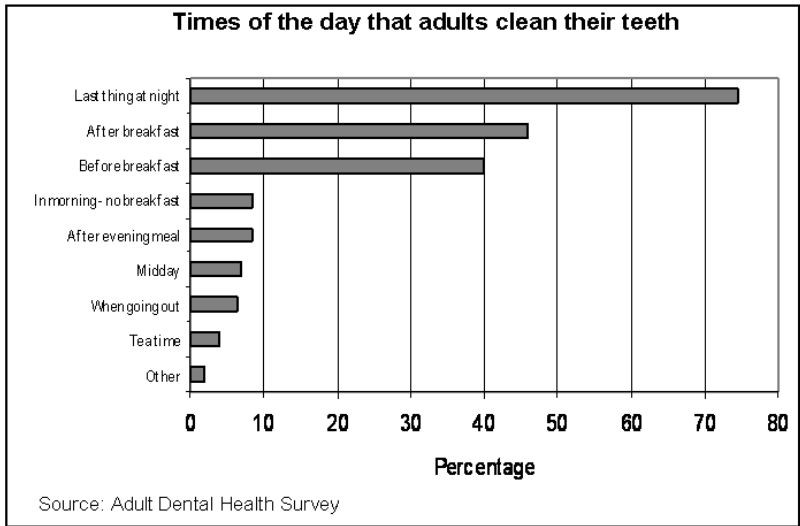
With nominal data, arranging the categories so that the bars grade sequentially from the largest category to the smallest category helps the reader to interpret the data. However, this is not appropriate for ordinal data because the categories already have an obvious sequence. Bar charts are also useful for displaying data that include categories with negative values, because it is possible to position the bars below and above the x-axis.



Different types of bar charts

Horizontal bar charts

Bar charts are normally drawn so that the bars are vertical which means that the taller the bar, the larger the category. However, it is also possible to draw bar charts so that the bars are horizontal which means that the longer the bar, the larger the category. This is a particularly effective way of presenting data when the different categories have long titles that would be difficult to include below a vertical bar, or when there are a large number of different categories and there is insufficient space to fit all the columns required for a vertical bar chart across the page.



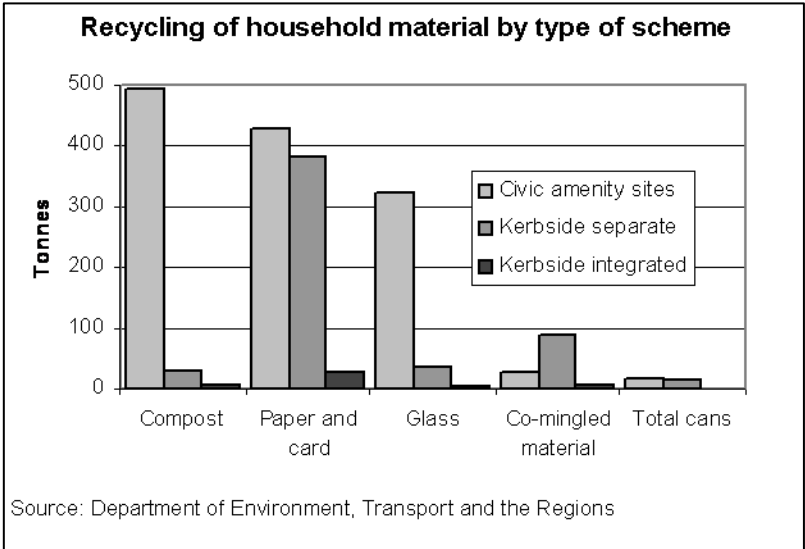
Note, that in Excel a chart in which the bars are presented vertically is referred to as a *column chart*, whilst a chart with horizontal bars is called a *bar chart*.

Grouped bar charts

Grouped bar charts are a way of showing information about different sub-groups of the main categories. In the example below, a grouped bar chart is used to show the different schemes (sub-groups) by which different categories of household materials are recycled.

A separate bar represents each of the sub-groups (e.g. civic amenity sites) and these are usually coloured or shaded differently to distinguish between them. In such cases, a legend or key is usually provided to indicate what sub-group each of the shadings/colours represent. The legend can be placed in the plot area or may be located below the chart.

Grouped bar charts can be used to show several sub-groups of each category but care needs to be taken to ensure that the chart does not contain too much information making it complicated to read and interpret. Grouped bar charts can be drawn as both horizontal or vertical charts depending upon the nature of the data to be presented.



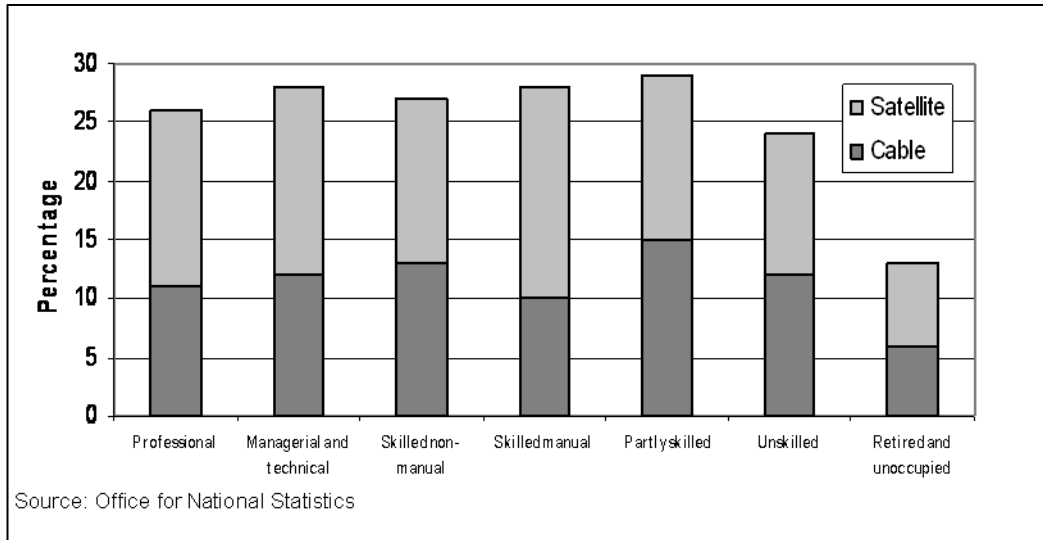
Stacked bar charts

Stacked bar charts are similar to grouped bar charts in that they are used to display information about the sub-groups that make up the different categories. In stacked bar charts the bars representing the sub-groups are placed on top of each other

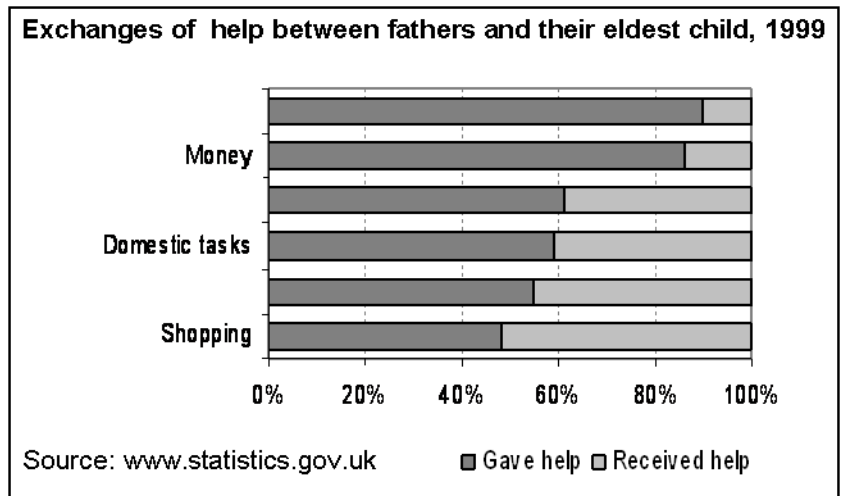
to make a single column, or side by side to make a single bar. The overall height or length of the bar shows the total size of the category whilst different colours or shadings are used to indicate the relative contribution of the different sub-groups.

Example of a stacked bar chart:

Subscription to satellite and cable TV by occupation of head of household



Stacked bar charts can also be used to show the percentage contribution different sub-groups contribute to each separate category. In this case the bars representing the individual categories are all the same size. The information could also be presented in a series of pie charts.



Where next?

This guide has outlined the various ways in which bar charts can be used to present data and has also provided design and presentation advice. Information about other graph and chart types and any specific design issues related to them can be found in the companion study guides: *Histograms* and *Pie charts*. The study guide *Presenting numerical data* provides guidance on when to use graphs to present information and compares the uses of different graph and chart types.

This study guide is one of a series produced by Student Learning Development at the University of Leicester. As part of our services we provide a range of resources for students wishing to develop their academic and transferable skills.

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