Latent variable analysis

The source to many of the notes in this lesson (and a lot more detail on the subject) can be found at Finch and French (2015) and Beaujean (2014).

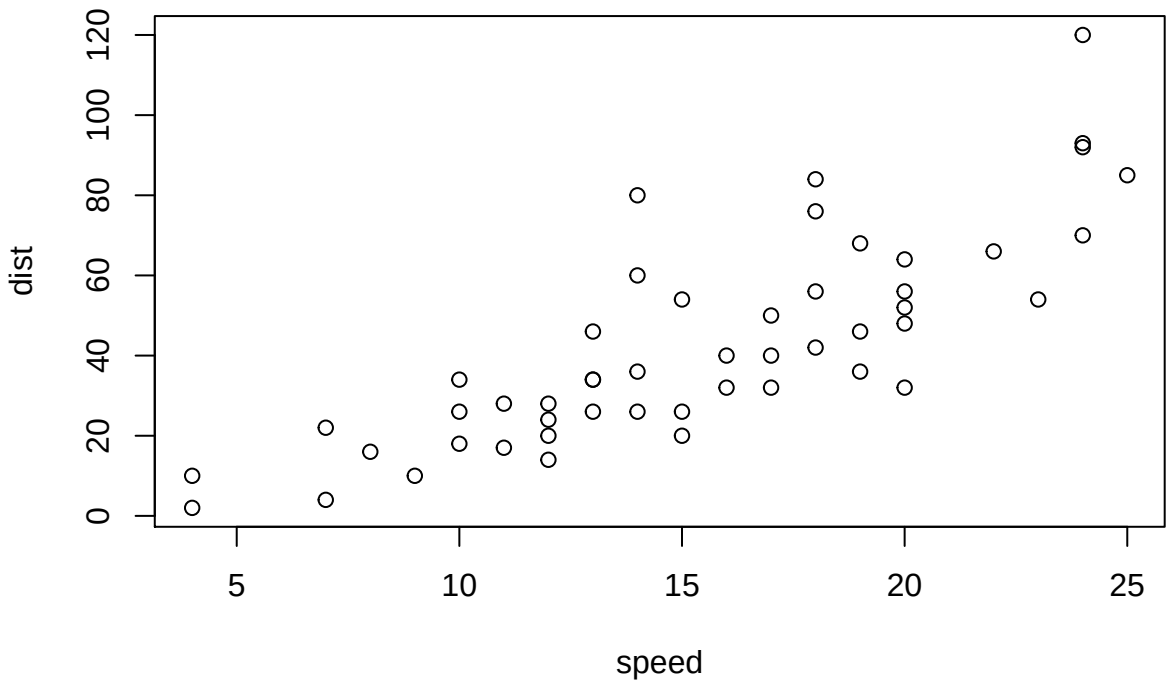
Latent variables in statistics are variables that are not directly observable and are inferred from a mathematical model. One advantage of using *latent variables* is that it helps reduce the dimensionality of data (a major theme of multivariate statistics) and has been used in many scientific disciplines.

One type of latent variable analysis is *factor analysis* and used extensively in social and behavioral sciences. Factor analysis allows the researcher to create models of non-observable factors (e.g., motivations, constraints, identity) from multivariate data.

There are two broad types of factor analysis: 1) Exploratory factor analysis (EFA) and 2) Confirmatory factor analysis (CFA). The difference between the two is in the degree of ** a priori ** structure that is assummed in the model. In using EFA the researcher does not imose a specific latent structure on the observable data, but allows the analysis to provide the optimal number of factors. In contrast to EFA, with CFA the researcher explicitly links the indicators with the factors to which they theoretically belong.

Exploratory factor analysis

```
plot(cars)
```



Add a new chunk by clicking the *Insert Chunk* button on the toolbar or by pressing *Cmd+Option+I*.

When you save the notebook, an HTML file containing the code and output will be saved alongside it (click the *Preview* button or press *Cmd+Shift+K* to preview the HTML file).

The preview shows you a rendered HTML copy of the contents of the editor. Consequently, unlike *Knit*, *Preview* does not run any R code chunks. Instead, the output of the chunk when it was last run in the editor is displayed.

References

Beaujean, A. A. 2014. Latent variable modeling using r: A step-by-step guide. Routledge.

Finch, W. H., and B. F. French. 2015. Latent variable modeling with r. Routledge.