

ABSORBENCY OF PAPER TOWELS

7. Displaying the Data

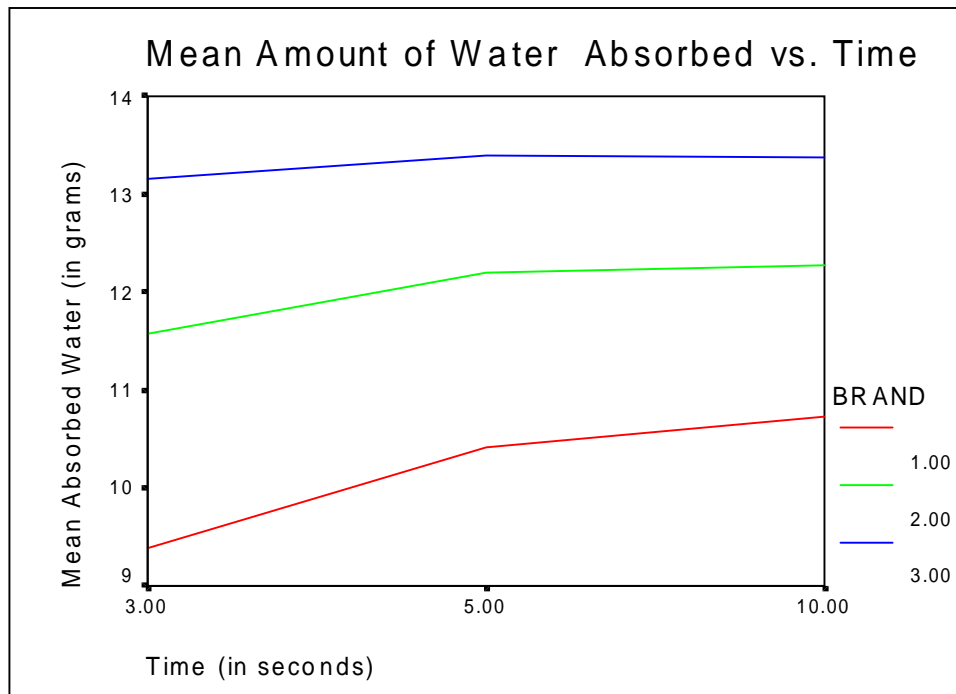
Graphical displays are very useful to gain insight into data. We will visualize the effects of towel brand and immersion time on the weight of water absorbed by the towel by obtaining the plot of mean weight of water absorbed versus time by brand and the scatterplot of weight of water absorbed versus time with brand as the grouping variable.

7.1 Plot of Mean Amount of Water Absorbed vs. Time by Brand

7.2 Plot of Mean Amount of Water Absorbed vs. Brand by Time

7.3 Scatterplot of Amount of Water Absorbed vs. Time with Brand as the Grouping Variable

7.1 SPSS produces the following line chart of mean amount of water absorbed versus time by towel brand:

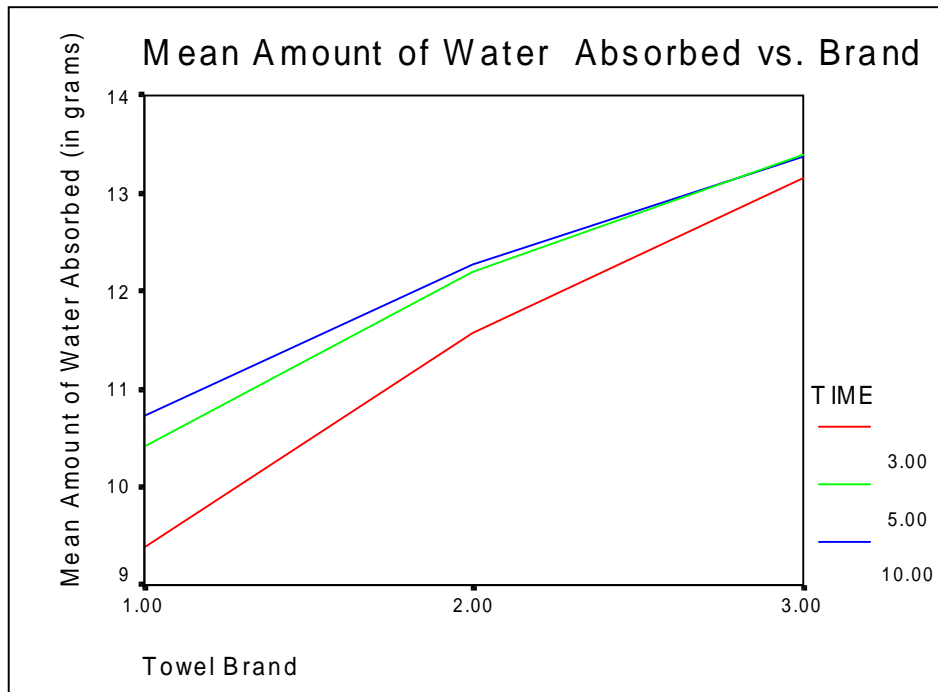


The lines in the graph are obtained by connecting the factor-level means for the three time levels. The plot indicates that the mean amount of water absorbed increases with the time level for all the three types of towels.

The mean amount of water absorbed is largest for the brand 3, smaller for the brand 2, and smallest for the brand 1 at all three time levels. The lines for the brands 2 and 3 are almost flat which indicates relatively small effects of time for the two brands. In other words, saturation has been achieved for the two brands almost immediately after putting a sheet from either of the two brands into the

water. The brand 1 absorbs water slower, time plays more significant role in this case. The graph indicates very weak interaction between the means for the different brands when taken across the time levels.

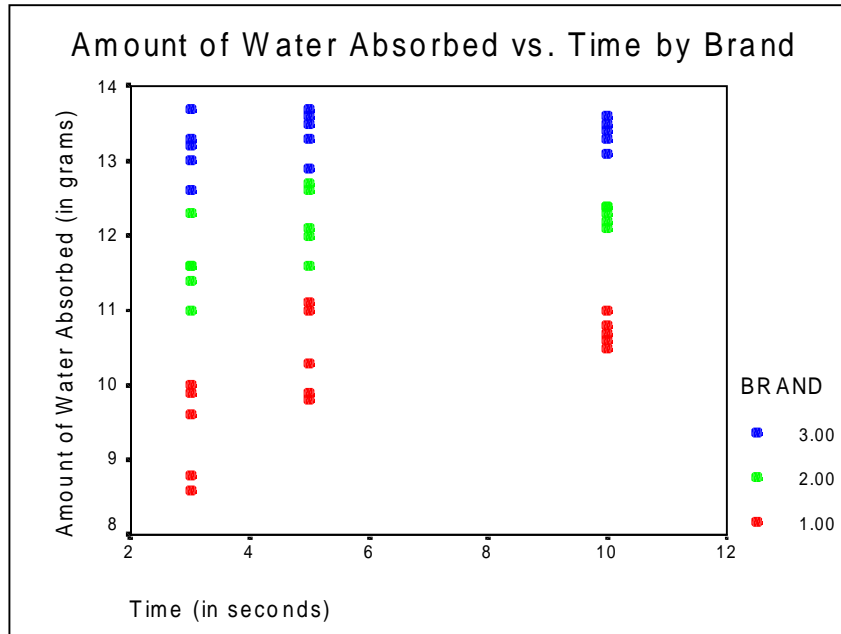
7.2 SPSS produces the following line chart of mean amount versus towel brand by time:



The plot does not provide any extra information compared to the plot discussed in Section 7.1. We have provided it for instructional reasons.

The plot indicates that the brand 3 has the best absorbency, and the brand 1 has the worst across the three time levels. The lines for the time levels 5 and 10 seconds are almost identical, there is no change in the mean amount of water absorbed as time changes from 5 seconds to 10 seconds. This indicates that water is absorbed very fast. The brand 1 absorbs water slower than the other brands.

7.3 The effects of various brand levels and immersion time on the amount of water absorbed can also be visualized with a scatterplot of amount of water absorbed versus time with brand as the grouping variable.



The above plot provides some extra information about the variability in the mean amount of water absorbed for the three brands when taken across the three time levels. The plot indicates that in general mean amount of water absorbed increases with time level. However, the rate of the increase is not even for the three brands. There is very little change in the mean amount for the brand 3 across the three time levels.

There is no overlap among the observations for the three brands, the brand 3 has the best absorption, the brand 2 a little bit worse, and the brand 1 the worst for all three time levels.

Observe that the variability in the mean amount of water absorbed decreases as time increases. The observations for the time level 10 seconds occur in three separate clusters, with very small variation within each cluster.