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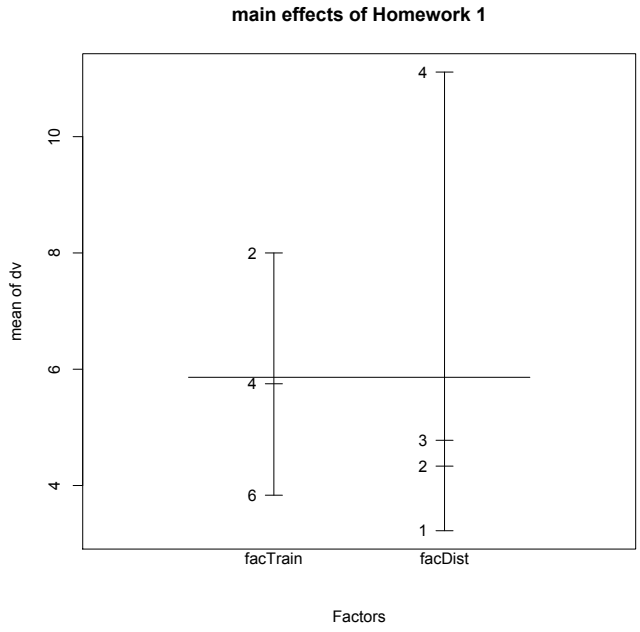
R-2 Graphs

For Psychology Methods Courses
(to accompany Homework #1, Montana State University 2014)

Graphs for between-group two-way factorial designs

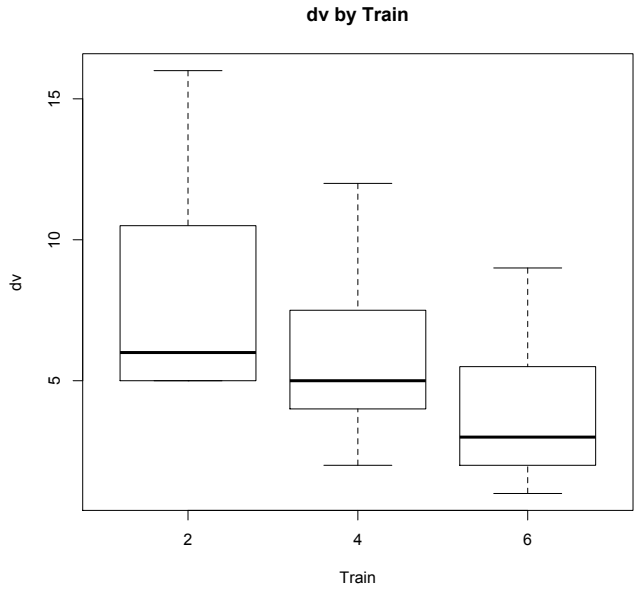
I. Plot the main effect means. This shows which factors have the largest effects.

```
> plot.design(dv~facTrain*facDist,main="main effects of
Homework 1")
```



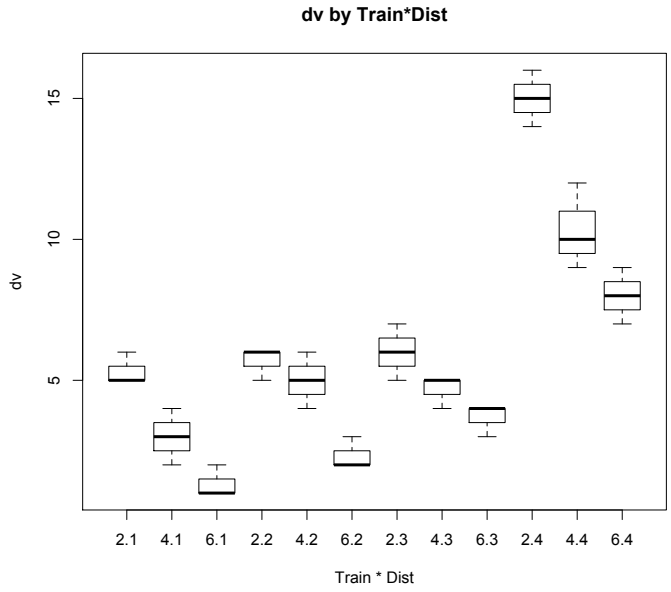
II. Boxplots, one way. These show a lot of aspects of the data, allowing visual inspection of outliers, homogeneity of variance, skew, etc.

```
> boxplot(dv~Train, main="dv by Train", xlab="Train",
ylab=" dv ")
```



III. Boxplots, two-way. These can be hard to read.

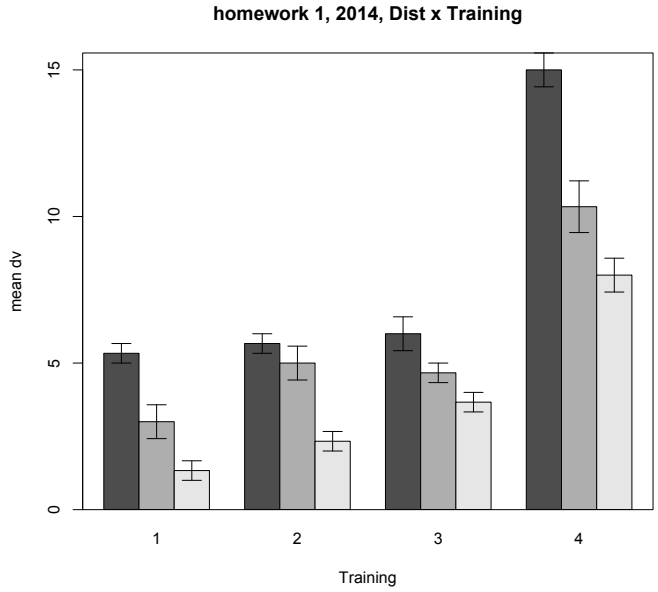
```
> boxplot(dv~Train*Dist, main="dv by Train*Dist",
xlab="Train * Dist")
```



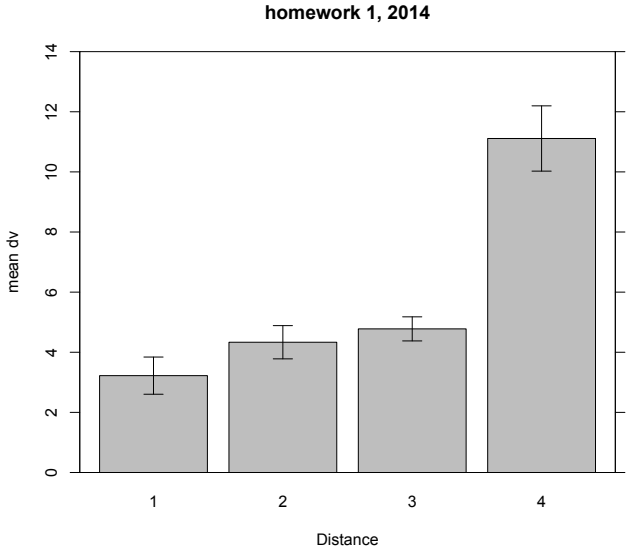
IV. Bar graphs

```
> library(sciplot)
```

```
> bargraph.CI(x.factor=Dist, response=dv,
group=Train,xlab="Training",ylab="mean dv", main="homework
1, 2014, Dist x Training")  # an interaction plot
> box()  # add a box around the plot
```

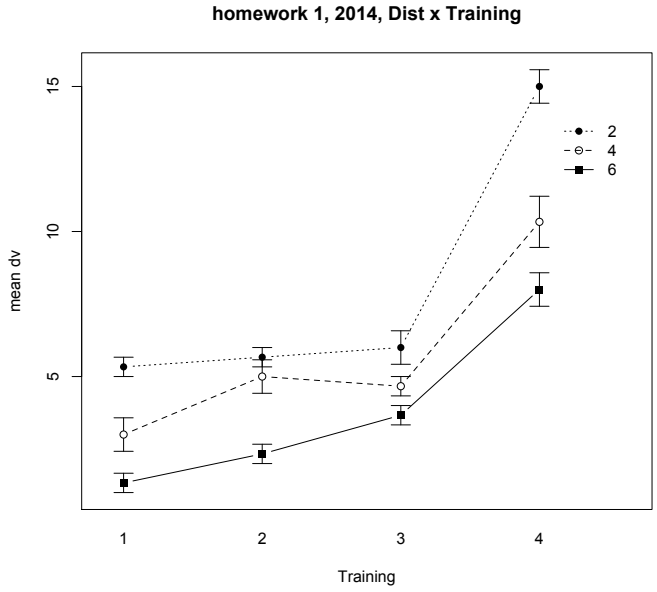



```
## main effect bar graph
> bargraph.CI(x.factor=facDist, response=dv,
xlab="Distance",ylab="mean dv", main="homework 1, 2014",
ylim=c(0,14))  # main effect of whatever is called x.factor
> box()

## standard error bars vary by condition in the graph. In a
main effect of a factorial design with equal numbers of
observations in the cells, I normally prefer an estimate of
the s.e. based on the pooled error from the ANOVA. For this
example, MSerror = 0.7778, and there are 9 observations in
each main effect mean.
##

> seTrain=sqrt(0.7777917/9)
> seTrain
[1] 0.293975

# compare the pooled s.e. calculated here to the bars below.
```



V. Line graphs

```
> library(sciplot)
> lineplot.CI(x.factor=facDist, response=dv,
group=facTrain,xlab="Training",ylab="mean dv",
main="homework 1, 2014, Dist x Training")

## gives an interaction plot. I made a mistake in labeling
the x-axis, should say Distance
```



```
## Can make a main effect line plot by leaving out 'group'
```

VI. Superpose function to make error bars "by hand"

```
> superpose.eb <-
 function (x, y, ebl, ebu = ebl, length = 0.08, ...)
     arrows(x, y + ebu, x, y - ebl, angle = 90, code = 3,
    length = length, ...)
```

http://users.fmg.uva.nl/rgrasman/rpages/2005/09/error -bars-in-plots.html the website of Raoul Grasman is the source of the 'superpose' function

```
## Remake the main effect bar plot with the pooled error
above.
See the handout titled, '610-R4_two-way_betw_extras.pdf'
for how to use superpose and build a graph with your own
calculated se bars.

> seDist=sqrt(0.7777917/9)
> DistMeans=c(3.222 ,4.333 ,4.778,11.111)
> Distbar=barplot(DistMeans,beside=T, ylim=c(0,14), main="
using pooled s.e.",xlab="Distance",ylab="dv",xpd=F )
> box(); axis(4, labels=F)
```