

```

> mental = read.table(file="D:\\drr06\\stat141\\Lect12\\fullmoon.dat", header = T)
> attach(mental)
> mentallway = aov(Admission ~ Moon)
> summary(mentallway)           #treats month as replication, 12 obs/cell
      Df Sum Sq Mean Sq F value Pr(>F)
Moon      2  41.51   20.76  1.1741 0.3217
Residuals 33 583.40   17.68

      show 3 x 12 structure
#recreate DASL plot
> monthind = rep(1:12,3) #need to impose order on months
> interaction.plot(monthind, Moon, Admission)

> tapply(Admission, list(monthind, Moon), mean) #cell means, n=1
      After Before During
1      5.8      6.4      5
2      9.2      7.1     13
3      7.9      6.5     14
4      7.7      8.6     12
5     11.0      8.1      6
6     12.9     10.4      9
7     13.5     11.5     13
8     13.1     13.8     16
9     15.8     15.4     25
10    13.3     15.7     14
11    12.8     11.7     14
12    14.5     15.8     20
> #starts Aug ends July

#two-way anova, now both effects significant
> mental2way = aov(Admission ~ Moon + Month)
> summary(mental2way)
      Df Sum Sq Mean Sq F value      Pr(>F)
Moon      2  41.51   20.76  3.5726  0.04533 *
Month     11 455.58   41.42  7.1285 5.076e-05 ***
Residuals 22 127.82    5.81

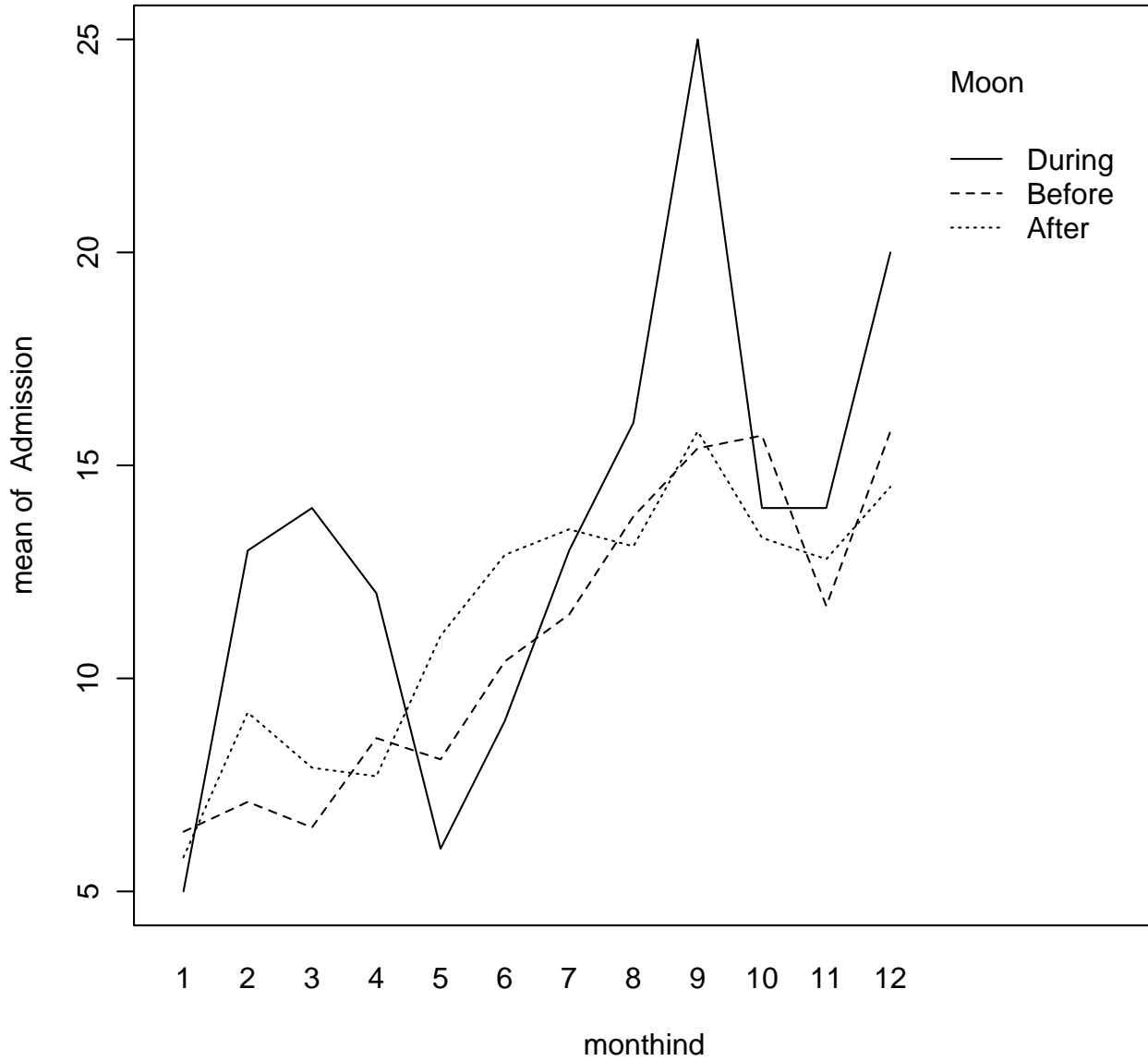
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
>

```

create indices for Aug to July time span

```
> monthind = rep(1:12,3)
```

```
> interaction.plot(monthind, Moon, Admission)
```



```
> TukeyHSD(mental2way)
  Tukey multiple comparisons of means
    95% family-wise confidence level
```

```
Fit: aov(formula = Admission ~ Moon + Month)
```

```
$Moon
```

	diff	lwr	upr	p adj
Before-After	-0.5416667	-3.01363015	1.930297	0.8473143
During-After	1.9583333	-0.51363015	4.430297	0.1382640
During-Before	2.5000000	0.02803652	4.971963	0.0471250

```
$Month
```

	diff	lwr	upr	p adj
Aug-Apr	-13.0000000	-20.15903984	-5.8409602	0.0000631
Dec-Apr	-10.36666667	-17.52570650	-3.2076268	0.0012994
Feb-Apr	-6.066666667	-13.22570650	1.0923732	0.1496863
Jan-Apr	-7.966666667	-15.12570650	-0.8076268	0.0206959
Jul-Apr	-1.966666667	-9.12570650	5.1923732	0.9960667
Jun-Apr	-5.90000000	-13.05903984	1.2590398	0.1745228
Mar-Apr	-4.433333333	-11.59237317	2.7257065	0.5330487
May-Apr	-4.40000000	-11.55903984	2.7590398	0.5434969
Nov-Apr	-9.30000000	-16.45903984	-2.1409602	0.0045044
Oct-Apr	-9.266666667	-16.42570650	-2.1076268	0.0046821
Sep-Apr	-8.966666667	-16.12570650	-1.8076268	0.0066267
Dec-Aug	2.633333333	-4.52570650	9.7923732	0.9640031
Feb-Aug	6.933333333	-0.22570650	14.0923732	0.0633963
Jan-Aug	5.033333333	-2.12570650	12.1923732	0.3576853
Jul-Aug	11.033333333	3.87429350	18.1923732	0.0005980
Jun-Aug	7.10000000	-0.05903984	14.2590398	0.0532271
Mar-Aug	8.566666667	1.40762683	15.7257065	0.0104953
May-Aug	8.60000000	1.44096016	15.7590398	0.0101025
Nov-Aug	3.70000000	-3.45903984	10.8590398	0.7588977
Oct-Aug	3.733333333	-3.42570650	10.8923732	0.7493888
Sep-Aug	4.033333333	-3.12570650	11.1923732	0.6590633
Feb-Dec	4.30000000	-2.85903984	11.4590398	0.5750210
Jan-Dec	2.40000000	-4.75903984	9.5590398	0.9812654
Jul-Dec	8.40000000	1.24096016	15.5590398	0.0126928
Jun-Dec	4.466666667	-2.69237317	11.6257065	0.5226421
Mar-Dec	5.933333333	-1.22570650	13.0923732	0.1693053
May-Dec	5.966666667	-1.19237317	13.1257065	0.1642146
Nov-Dec	1.066666667	-6.09237317	8.2257065	0.9999872
Oct-Dec	1.10000000	-6.05903984	8.2590398	0.9999825
Sep-Dec	1.40000000	-5.75903984	8.5590398	0.9998138
Jan-Feb	-1.90000000	-9.05903984	5.2590398	0.9970559
Jul-Feb	4.10000000	-3.05903984	11.2590398	0.6381994
Jun-Feb	0.166666667	-6.99237317	7.3257065	1.0000000
Mar-Feb	1.633333333	-5.52570650	8.7923732	0.9992191
May-Feb	1.666666667	-5.49237317	8.8257065	0.9990631
Nov-Feb	-3.233333333	-10.39237317	3.9257065	0.8747334
Oct-Feb	-3.20000000	-10.35903984	3.9590398	0.8815456
Sep-Feb	-2.90000000	-10.05903984	4.2590398	0.9329667
Jul-Jan	6.00000000	-1.15903984	13.1590398	0.1592489
Jun-Jan	2.066666667	-5.09237317	9.2257065	0.9940896
Mar-Jan	3.533333333	-3.62570650	10.6923732	0.8042662
May-Jan	3.566666667	-3.59237317	10.7257065	0.7955069
Nov-Jan	-1.333333333	-8.49237317	5.8257065	0.9998834
Oct-Jan	-1.30000000	-8.45903984	5.8590398	0.9999087
Sep-Jan	-1.00000000	-8.15903984	6.1590398	0.9999933
Jun-Jul	-3.933333333	-11.09237317	3.2257065	0.6899464
Mar-Jul	-2.466666667	-9.62570650	4.6923732	0.9771591
May-Jul	-2.433333333	-9.59237317	4.7257065	0.9792886

Nov-Jul	-7.33333333	-14.49237317	-0.1742935	0.0414981
Oct-Jul	-7.30000000	-14.45903984	-0.1409602	0.0430122
Sep-Jul	-7.00000000	-14.15903984	0.1590398	0.0591328
Mar-Jun	1.46666667	-5.69237317	8.6257065	0.9997108
May-Jun	1.50000000	-5.65903984	8.6590398	0.9996431
Nov-Jun	-3.40000000	-10.55903984	3.7590398	0.8375341
Oct-Jun	-3.36666667	-10.52570650	3.7923732	0.8453798
Sep-Jun	-3.06666667	-10.22570650	4.0923732	0.9066121
May-Mar	0.03333333	-7.12570650	7.1923732	1.0000000
Nov-Mar	-4.86666667	-12.02570650	2.2923732	0.4032190
Oct-Mar	-4.83333333	-11.99237317	2.3257065	0.4126699
Sep-Mar	-4.53333333	-11.69237317	2.6257065	0.5019803
Nov-May	-4.90000000	-12.05903984	2.2590398	0.3938784
Oct-May	-4.86666667	-12.02570650	2.2923732	0.4032190
Sep-May	-4.56666667	-11.72570650	2.5923732	0.4917380
Oct-Nov	0.03333333	-7.12570650	7.1923732	1.0000000
Sep-Nov	0.33333333	-6.82570650	7.4923732	1.0000000
Sep-Oct	0.30000000	-6.85903984	7.4590398	1.0000000