

Applied Linear Mixed Models in Behavioral Research

Assignment for Lecture 4: due 4/13/2007

In this assignment you will be asked to replicate part of the analyses done in class. You will also be asked to analyze the data using a different unit of analysis: school. The point of this exercise is to practice with the syntax covered in class, and to try the syntax with different options.

1. Process the data with these commands and answer the questions that follow them.

```
df1 <- read.csv(file = "http://biosun1.harvard.edu/~fitzmaur/ala/tvsfp.txt", skip
= 44, sep="", header = FALSE). Note that the file is an URL. This feature makes it easy to
share data with others over the internet.
```

Q: In `read.csv()` there is a `comment.char` optional parameter, explain what it does and how it can be used to document your data.

```
df1 <- data.frame(df1)
```

Q: After the step above, the variables are named "V1", "V2", etc. Describe how you can add names to these variables so that they can be analyzed for the `lme()` function later.

```
attributes(df1)$comment <- "Flay et al. (1995). The television, school, and
family smoking prevention and cessation project. Preventive Medicine, 24, 29-40."
```

```
attributes(df1)$comment
```

Q: Explain what `attributes()` does? Can it be used as an alternative method to add documentations to the data?

2. Carry out the `tv1me1` analysis (see your handouts) using `df1`. Remember to assign variable names to `df1` or the `lme()` function will not work.
3. Look up the following statistics from the output:

The standard deviation of the `school` random effect.

The standard deviation of the `class` random effect.

4. Now run the following model called `tv1me2`. What is the difference between `tv1me1` and `tv1me2`? What can you conclude from the `anova()` command below?

```
tv1me2 <- lme(postthks ~ prethks + schtx * tvtx, random = ~ 1 | school, data =
df1)
```

```
anova(tv1me1, tv1me2)
```

```
tv1me3 <- lme(postthks ~ prethks + schtx * tvtx, random = 1 + prethks |
school/class, data = tvsfp.df)
```

Q: How is this model different from `tv1me1`?

Q: Can you tell which model is better by `anova(tv1me1, tv1me3)`?

5. Finally, repeat the `xyplot` command in your handouts (don't forget to load the required libraries). But this time, replace the `panel.loess(x, y, ...)` by `panel.lmline(x, y, ...)`. Keep everything else the same. What difference does this make to the graph?