Analysis of Variance with Repeated Measurements

One-Way ANOVA with Repeated Measurements

Example 12.8 Positive and Negative Influences on Children

A recent General Social Survey asked subjects to respond to the following: "Children are exposed to many influences in their daily lives. What kind of influence does each of the following have on children? 1. Movies, 2. Programs on network television, 3. Rock music." The possible responses were (very negative, negative, neutral, positive, very positive). Table 12.17 shows responses for 12 of the sampled subjects, using scores $(-2, -1, 0, 1, 2)$ for the possible responses. This is part of a much larger data file for more than 1000 respondents. We analyze only this small sample here to help explain the concepts and so you can easily use your own software to try to replicate results.

Table 12.17: Opinions About Three Influences on Children. The scores represent -2 = very negative, -1 = negative, 0 = neutral, 1 = positive, 2 = very positive.

	Influence		
Subject	Movies	TV	Rock
1	-1	0	-1
2	1	0	0
3	0	1	-2
4	2	0	1
5	0	-1	-1
6	-2	-2	-2
7	-1	-1	0
8	0	1	-1
9	-1	-1	-1
10	1	0	1
11	1	1	-1
12	-1	-1	-2
Mean	-0.08	-0.25	-0.75

Fixed and Random Effects

for the sample. The subject effect is called a ***random effect***, because the categories of that factor represent a random sample of all the possible ones. By contrast, the factor that defines the groups, influence type, is called a ***fixed effect***. The analyses use *all* the categories of interest of a fixed effect, rather than a random sample of them. Models studied in earlier sections of this chapter contained only fixed effects.

When the classification variables are a mixture of random and fixed effects, such as in this example, the model is called a ***mixed model***. For more complex mixed models than this one, the test statistics differ for some tests from their form when all classification variables are fixed effects. The next section discusses an important case.