

What happens when a main effect is left out?

- Does R fit non-hierarchical model?
- Fit the model to a marginal table, adding over the missing dimension?
- Something else?

Soap

1. Water softness (Soft Medium Hard)
2. Previous use of detergent M (Yes No)
3. Water temperature (High Low)
4. Brand preference in a blind test ($X M$)

Suppose we accidentally left out Previous Use = 2

1. Water softness (Soft Medium Hard)
2. Previous use of detergent M (Yes No)
3. Water temperature (High Low)
4. Brand preference in a blind test ($X M$)

Model	G^2	df
<code>loglin(soap,list(c(1,3),c(1,4)))</code>	38.3555	15
<code>loglin(soap,list(2,c(1,3),c(1,4)))</code>	36.4343	14
<code>soap134 = margin.table(soap,c(1,3,4)) # Now 1=Soft, 2=Temp, 3=Pref</code>		
<code>loglin(soap134,list(c(1,2),c(1,3)))</code>	4.431698	3

How about a non-hierarchical model we can do by hand?

- 2x2, Previous Use by Preference, independent
- $\log m_{i,j} = \mu + \mu_{1(i)}$
- $df = 4 - 2 = 2$

p_{11} $\frac{1}{2}(p_{11}+p_{12})$	p_{12} $\frac{1}{2}(p_{11}+p_{12})$	$p_{11}+p_{12}$
p_{21} $\frac{1}{2}(p_{21}+p_{22})$	p_{22} $\frac{1}{2}(p_{21}+p_{22})$	$p_{21}+p_{22}$
$\frac{1}{2}$	$\frac{1}{2}$	1.00

Expected frequencies should be half the row total, and $df=2$

```
> testit = margin.table(soap,c(2,4)); testit
      Pref
Prev_Use 1=X 2=M
      1=Yes 207 275
      2=No  301 225
> testor = loglin(testit,list(1),fit=T,print=F)
> testor$df
[1] 2
> testor$fit
      Pref
Prev_Use 1=X 2=M
      1=Yes 241 241
      2=No  263 263
> (207+275)/2
[1] 241
> testor$margin
[[1]]
[1] "Prev_Use"

> testor = loglin(testit,list(1),fit=T,param=T,print=F); testor
Error in dyadic[i - 1, ] : incorrect number of dimensions
```

Conclusions

- *R* appears to be fitting a non-hierarchical model
- Not all non-hierarchical models are available
- Use with caution if at all.

```
> margin.table(soap,c(2)) # Close to 50-50?  
Prev_Use  
1=Yes   2=No  
  482   526
```