

## Higher-Way Contingency Tables (ctd.)

### Logistic Regression Analysis of the Admission Data

```
glm(formula = cbind(yes, no) ~ program + sex, family = binomial)
```

	Estimate	Std. Error	z value	Pr(> z )
(Intercept)	0.58205	0.06899	8.436	<2e-16 ***
programB	-0.04340	0.10984	-0.395	0.693
programC	-1.26260	0.10663	-11.841	<2e-16 ***
programD	-1.29461	0.10582	-12.234	<2e-16 ***
programE	-1.73931	0.12611	-13.792	<2e-16 ***
programF	-3.30648	0.16998	-19.452	<2e-16 ***
sexF	0.09987	0.08085	1.235	0.217

Null deviance: 877.056 on 11 degrees of freedom  
 Residual deviance: 20.204 on 5 degrees of freedom

#### TRANSFORMED COEFFICIENTS AND 95% C.I.'s

		2.5 %	97.5 %
(Intercept)	1.78970606	1.56334599	2.04884127
programB	0.95753028	0.77207142	1.18753812
programC	0.28291804	0.22955913	0.34867975
programD	0.27400567	0.22268066	0.33716044
programE	0.17564230	0.13717694	0.22489361
programF	0.03664494	0.02626184	0.05113317
sexF	1.10502735	0.94309706	1.29476117

#### TESTING FOR INTERACTION

##### Analysis of Deviance Table

Model: binomial, link: logit

Response: cbind(yes, no)

Terms added sequentially (first to last)

	Df	Deviance	Resid. Df	Resid. Dev	P(> Chi )
NULL			11	877.06	
program	5	855.32	6	21.74	1.242e-182
sex	1	1.53	5	20.20	0.22
program:sex	5	20.20	0	-1.581e-13	1.144e-03

## Log-linear analysis of a $2 \times 2 \times 2$ table

	venography = +		venography = -		
	ultrasound		ultrasound		
d.dimer	+	-	d.dimer	+	-
	+ 61	15	+ 4	35	
	- 24	6	- 15	150	

... AFTER RE-ORGANIZATION IN A DATA.FRAME

	counts	d.dimer	ultrasound	venography
1	61	+	+	+
2	24	-	+	+
3	15	+	-	+
4	6	-	-	+
5	4	+	+	-
6	15	-	+	-
7	35	+	-	-
8	150	-	-	-

### EXAMINING PATTERNS OF ASSOCIATION

#### Analysis of Deviance Table

Model 1: counts ~ d.dimer + ultrasound + venography  
 Model 2: counts ~ d.dimer + ultrasound \* venography  
 Model 3: counts ~ d.dimer + ultrasound + venography  
           + venography:(d.dimer + ultrasound)  
 Model 4: counts ~ d.dimer \* ultrasound + venography  
           + venography:(d.dimer + ultrasound)  
 Model 5: counts ~ d.dimer \* ultrasound \* venography

	Resid.	Df	Resid.	Dev	Df	Deviance	P(> Chi )
1	4		247.198				
2	3		83.542	1	163.655	1.799e-37	
3	2		0.051	1	83.492	6.398e-20	
4	1		0.021	1	0.029	0.864	
5	0		-2.665e-15	1	0.021	0.884	