

Goodness-of-Fit Tests

R Handout

Derek H. Ogle

First Commands

```
> library(NCStats)
```

Goodness-of-Fit Test

Four-o'clocks (*Mirabilis jalapa*) are plants native to tropical America. Individual four-o'clocks can have red, white, or pink flowers. Flower color in this species is thought to be controlled by a single gene locus with two alleles expressing incomplete dominance, so that heterozygotes are pink-flowered, while homozygotes for one allele are white-flowered and homozygotes for the other allele are red-flowered (see this). According to Mendelian genetic principles, self-pollination of pink-flowered plants should produce progeny that have red, pink, and white flowers in a 1:2:1 ratio. A horticulturist allowed several pink-flowered plants to self-pollinate and produce 240 progeny with 55 that were red-flowered, 132 that were pink-flowered, and 53 that were white-flowered. Use the results to determine, at the 5% level, if the theoretical 1:2:1 ratio is upheld with these data.

```
> obs <- c(red=55,pink=132,white=53)
> exp.p <- c(red=1/4,pink=2/4,white=1/4)
> chi1 <- chisq.test(obs,p=exp.p,rescale.p=TRUE,correct=FALSE)
> chi1$expected
```

```
red  pink white
 60   120   60
```

```
> chi1$observed
```

```
red  pink white
 55   132   53
```

```
> chi1
```

```
Chi-squared test for given probabilities with obs
X-squared = 2.4333, df = 2, p-value = 0.2962
```

```
> gofCI(chi1,digits=3)
```

	p.obs	p.LCI	p.UCI	p.exp
red	0.229	0.181	0.286	0.25
pink	0.550	0.487	0.612	0.50
white	0.221	0.173	0.277	0.25