Hw 6

Problem 1

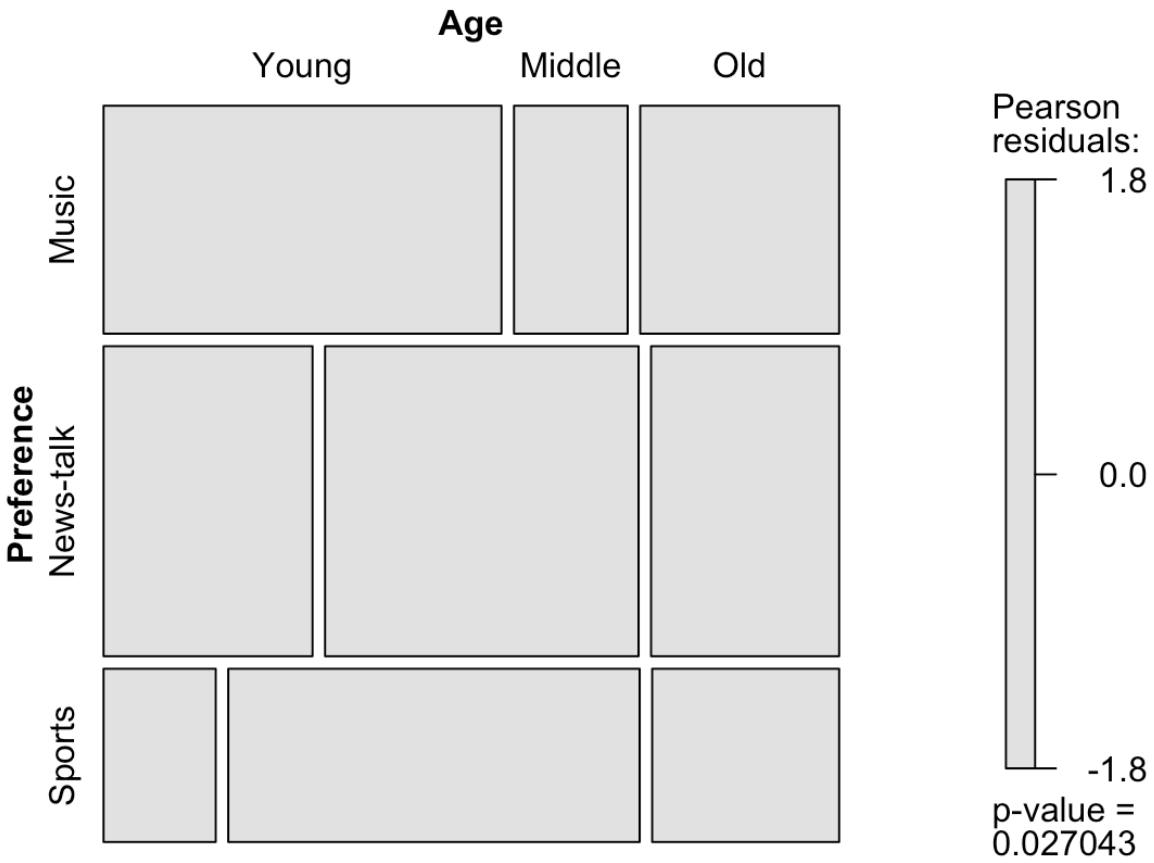
(1)

```
        Pearson's Chi-squared test

data:  dt1
X-squared = 10.958, df = 4, p-value = 0.02704
```

Since p-value of chi-square test is smaller than 0.05, so we reject the null hypothesis and we can say like radio format preference and age are related(dependent).

(2)

```
   Cell Contents
|-------------------------|
|                   Count |
|             Row Percent |
|          Column Percent |
|-------------------------|

Total Observations in Table:  78

             | Age
  Preference |    Young  |   Middle  |      Old  | Row Total |
-------------|-----------|-----------|-----------|-----------|
       Music |       14  |        4  |        7  |       25  |
             |   56.000% |   16.000% |   28.000% |   32.051% |
             |   51.852% |   13.333% |   33.333% |           |
-------------|-----------|-----------|-----------|-----------|
   News-talk |       10  |       15  |        9  |       34  |
             |   29.412% |   44.118% |   26.471% |   43.590% |
             |   37.037% |   50.000% |   42.857% |           |
-------------|-----------|-----------|-----------|-----------|
      Sports |        3  |       11  |        5  |       19  |
             |   15.789% |   57.895% |   26.316% |   24.359% |
             |   11.111% |   36.667% |   23.810% |           |
-------------|-----------|-----------|-----------|-----------|
Column Total |       27  |       30  |       21  |       78  |
             |   34.615% |   38.462% |   26.923% |           |
-------------|-----------|-----------|-----------|-----------|
```

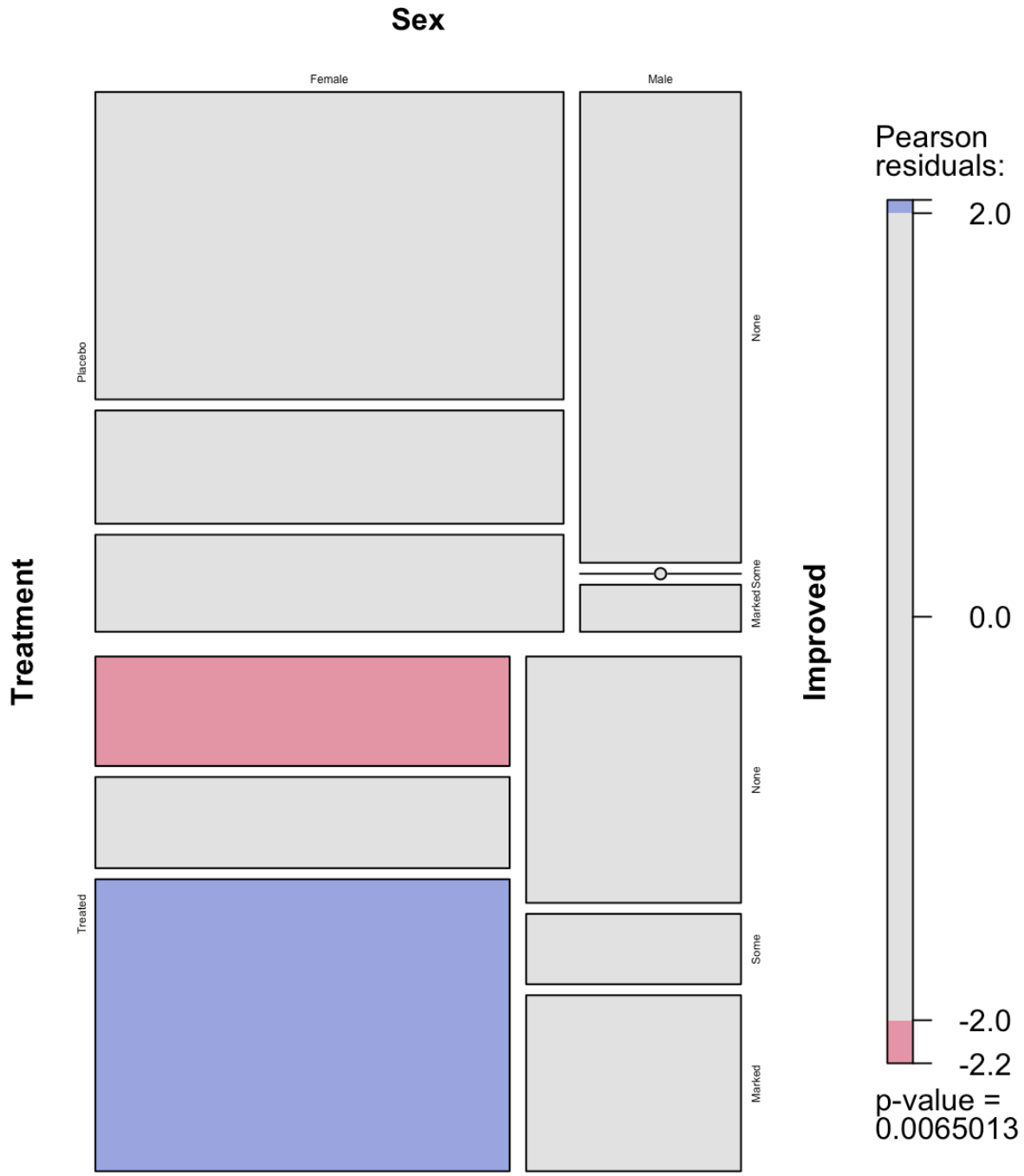

Age
Young
Middle
Old
Preference
Music
News-talk
Sports
Pearson residuals:
1.8
0.0
-1.8
p-value = 0.027043

Problem 2

(1)

```
> ar <- Arthritis[,-c(1,4)]
> (tar <- table(ar))
, , Improved = None

         Sex
Treatment Female Male
  Placebo     19   10
  Treated      6    7

, , Improved = Some

         Sex
Treatment Female Male
  Placebo      7    0
  Treated      5    2

, , Improved = Marked

         Sex
Treatment Female Male
  Placebo      6    1
  Treated     16    5
```

(2)

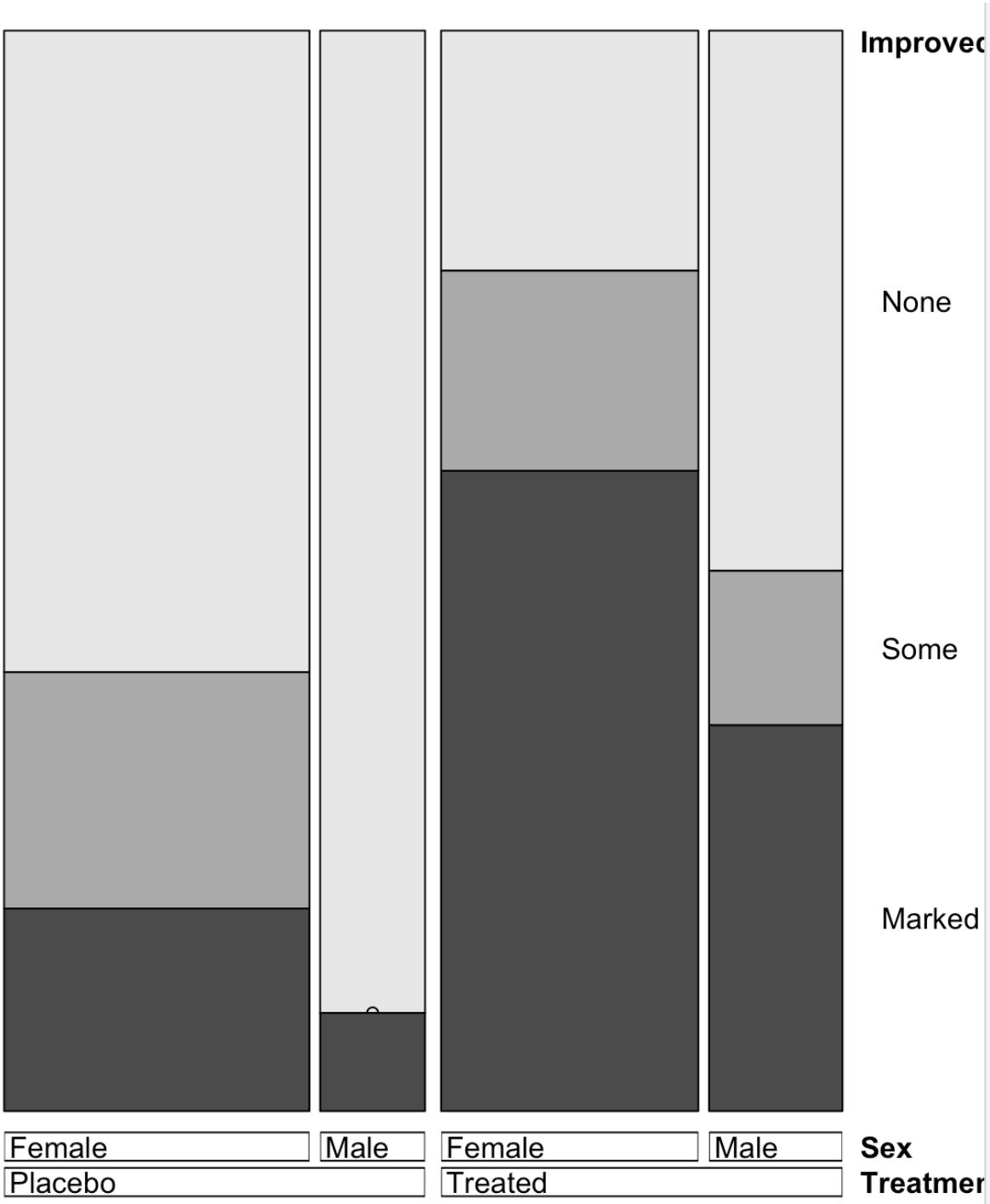

Sex
Female
Male
Treatment
Placebo
Treated
Improved
None
Some
Marked
Pearson residuals:
2.0
0.0
-2.0
-2.2
p-value = 0.0065013

(3)

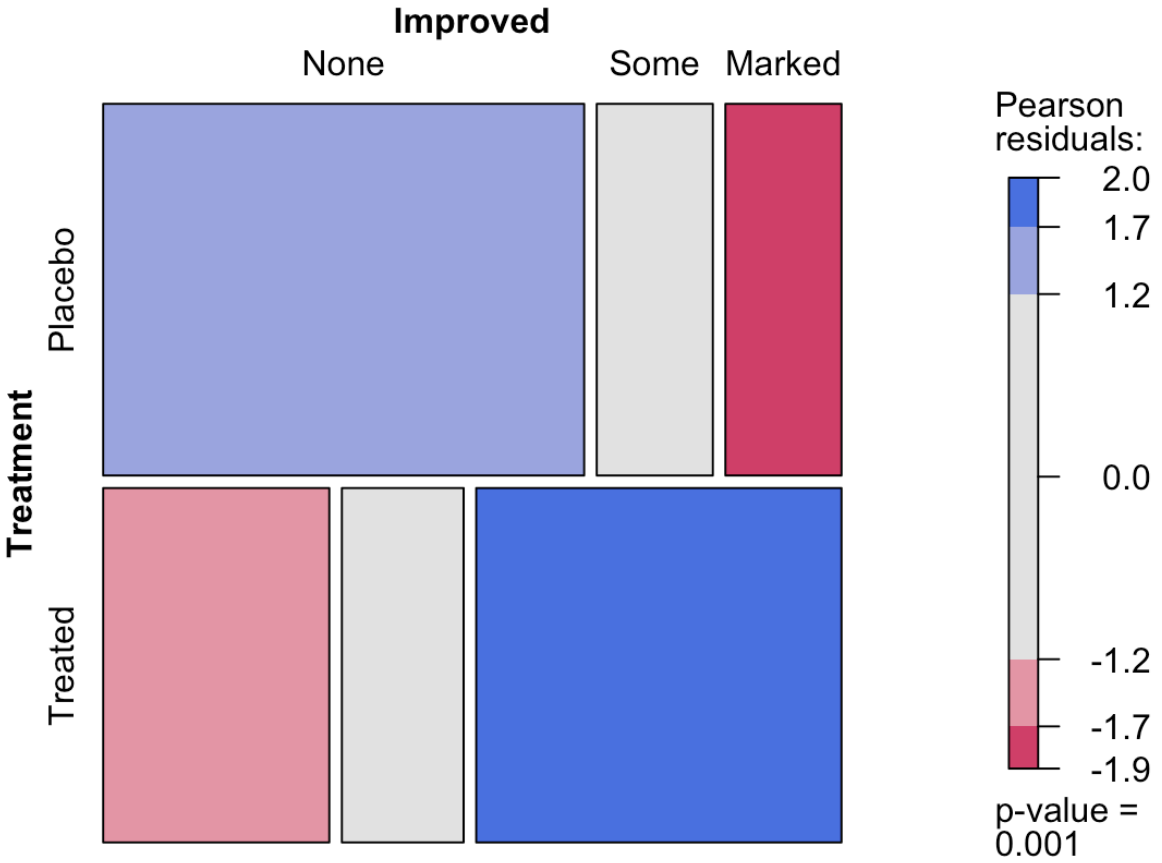
```
> mantelhaen.test(tar)

        Mantel-Haenszel chi-squared test with continuity correction

data:  tar
Mantel-Haenszel X-squared = 2.0863, df = 1, p-value = 0.1486
alternative hypothesis: true common odds ratio is not equal to 1
95 percent confidence interval:
 0.8566711 8.0070521
sample estimates:
common odds ratio
         2.619048
```

Since p-value is way greater than 0.05, so we fail to reject the null hypothesis. Hence, we can say like “Treatment and Sex are conditionally independent of Improved”.

(4)


Improved
None
Some
Marked
Female
Male
Female
Male
Sex
Placebo
Treated
Treatmer

(5)


Improved
None
Some
Marked
Treatment
Placebo
Treated
Pearson residuals:
2.0
1.7
1.2
0.0
-1.2
-1.7
-1.9
p-value = 0.001