Comparing Age Assignments

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20-Aug-2016

Preliminaries

```
> library(FSAdata)                        # for StripedBass4 data
> library(FSA)                            # for headtail(), ageBias(), agePrecision()
```

Loading Data

```
> data(StripedBass4)
> SB <- StripedBass4
> str(SB)
'data.frame':   1202 obs. of  2 variables:
 $ reader1: int  2 2 2 2 2 2 2 2 2 2 ...
 $ reader2: int  2 2 2 2 2 2 2 2 2 2 ...

> headtail(SB)
     reader1 reader2
1          2       2
2          2       2
3          2       2
1200      13      18
1201      18      18
1202      19      20
```

Examine Age Bias

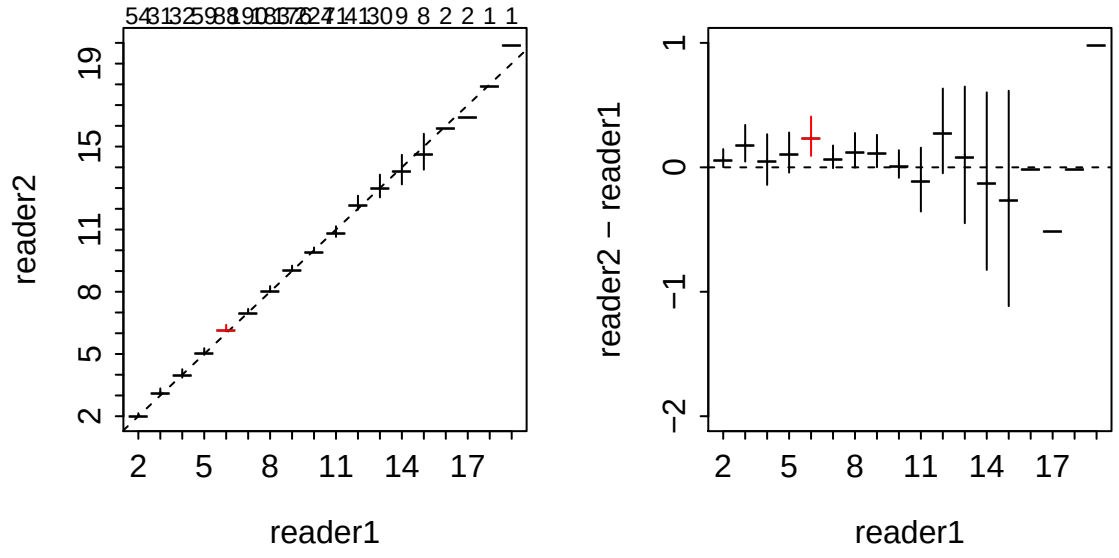
```
> ab <- ageBias(reader2~reader1,data=SB)

> summary(ab,what="table",flip.table=TRUE)
       reader1
reader2  2  3  4  5  6  7  8  9 10 11 12 13 14 15 16 17 18 19 20
     20  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  1  -
     19  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -
     18  -  -  -  -  -  -  -  -  -  -  -  1  -  -  -  -  1  -  -
     17  -  -  -  -  -  -  -  -  -  -  -  -  -  1  -  1  -  -  -
     16  -  -  -  -  -  -  -  -  -  -  -  -  -  -  2  1  -  -  -
     15  -  -  -  -  -  -  -  -  -  -  1  2  2  3  -  -  -  -  -
     14  -  -  -  -  -  -  -  -  -  2  6  8  5  4  -  -  -  -  -
     13  -  -  -  -  -  -  1  -  -  3  5  8  1  -  -  -  -  -  -
     12  -  -  -  -  -  -  -  1 17 13 23  9  1  -  -  -  -  -  -
     11  -  -  -  -  -  1  1  4 22 25  4  1  -  -  -  -  -  -  -
     10  -  -  -  -  -  2 15 51 144 24  2  1  -  -  -  -  -  -  -
     9   -  -  -  -  1  1 29 89 32  4  -  -  -  -  -  -  -  -  -
     8   -  -  -  -  3 21 97 25  9  -  -  -  -  -  -  -  -  -  -
     7   -  -  -  3 23 149 38  5  -  -  -  -  -  -  -  -  -  -  -
     6   -  -  -  6 51 15  2  -  -  -  -  -  -  -  -  -  -  -  -
     5   -  -  5 45 10  1  -  1  -  -  -  -  -  -  -  -  -  -  -
     4   -  6 25  5  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -
     3   4 25  1  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -
     2  50  -  1  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -
```

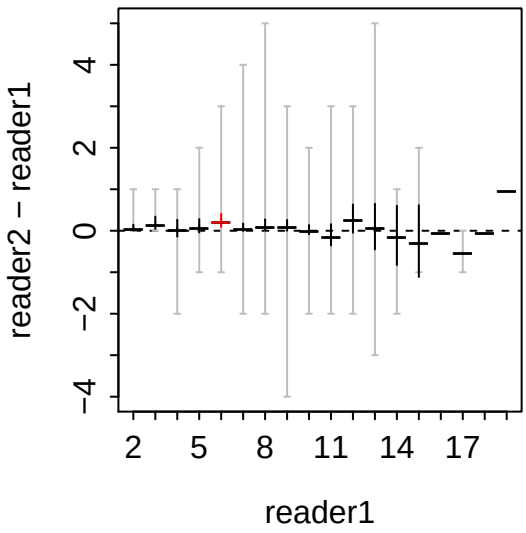
```
> summary(ab,what="symmetry")
      symTest df    chi.sq            p
1     McNemar  1  9.204793 0.0024138229
2 EvansHoenig  5 19.824421 0.0013481675
3      Bowker 37 72.685469 0.0004126986
```

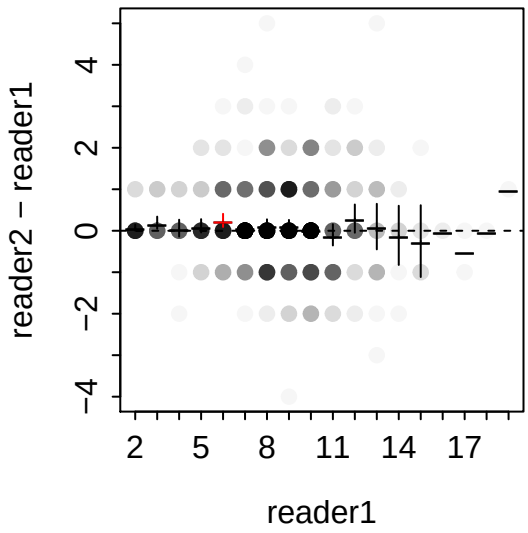
```
> summary(ab,what="bias")
 reader1   n min max  mean     SE      t  adj.p   sig   LCI   UCI
       2  54   2   3  2.07 0.0360  2.059 0.5329 FALSE  2.00  2.15
       3  31   3   4  3.19 0.0721  2.683 0.1527 FALSE  3.05  3.34
       4  32   2   5  4.06 0.0998  0.626 1.0000 FALSE  3.86  4.27
       5  59   4   7  5.12 0.0805  1.474 1.0000 FALSE  4.96  5.28
       6  88   5   9  6.25 0.0796  3.141 0.0322  TRUE  6.09  6.41
       7 190   5  11  7.08 0.0462  1.823 0.6294 FALSE  6.99  7.18
       8 183   6  13  8.14 0.0705  1.937 0.5423 FALSE  8.00  8.28
       9 176   5  12  9.13 0.0660  1.981 0.5404 FALSE  9.00  9.26
      10 224   8  12 10.03 0.0562  0.477 1.0000 FALSE  9.92 10.14
      11  71   9  14 10.90 0.1287 -0.766 1.0000 FALSE 10.64 11.16
      12  41  10  15 12.29 0.1684  1.738 0.7187 FALSE 11.95 12.63
      13  30  10  18 13.10 0.2685  0.372 1.0000 FALSE 12.55 13.65
      14   9  12  15 13.89 0.3093 -0.359 1.0000 FALSE 13.18 14.60
      15   8  14  17 14.75 0.3660 -0.683 1.0000 FALSE 13.88 15.62
      16   2  16  16 16.00     NA     NA     NA FALSE    NA    NA
      17   2  16  17 16.50     NA     NA     NA FALSE    NA    NA
      18   1  18  18 18.00     NA     NA     NA FALSE    NA    NA
      19   1  20  20 20.00     NA     NA     NA FALSE    NA    NA
```

```
> plot(ab)                                    # Left
> plot(ab,diff=TRUE,show.n=FALSE)             # Right
```

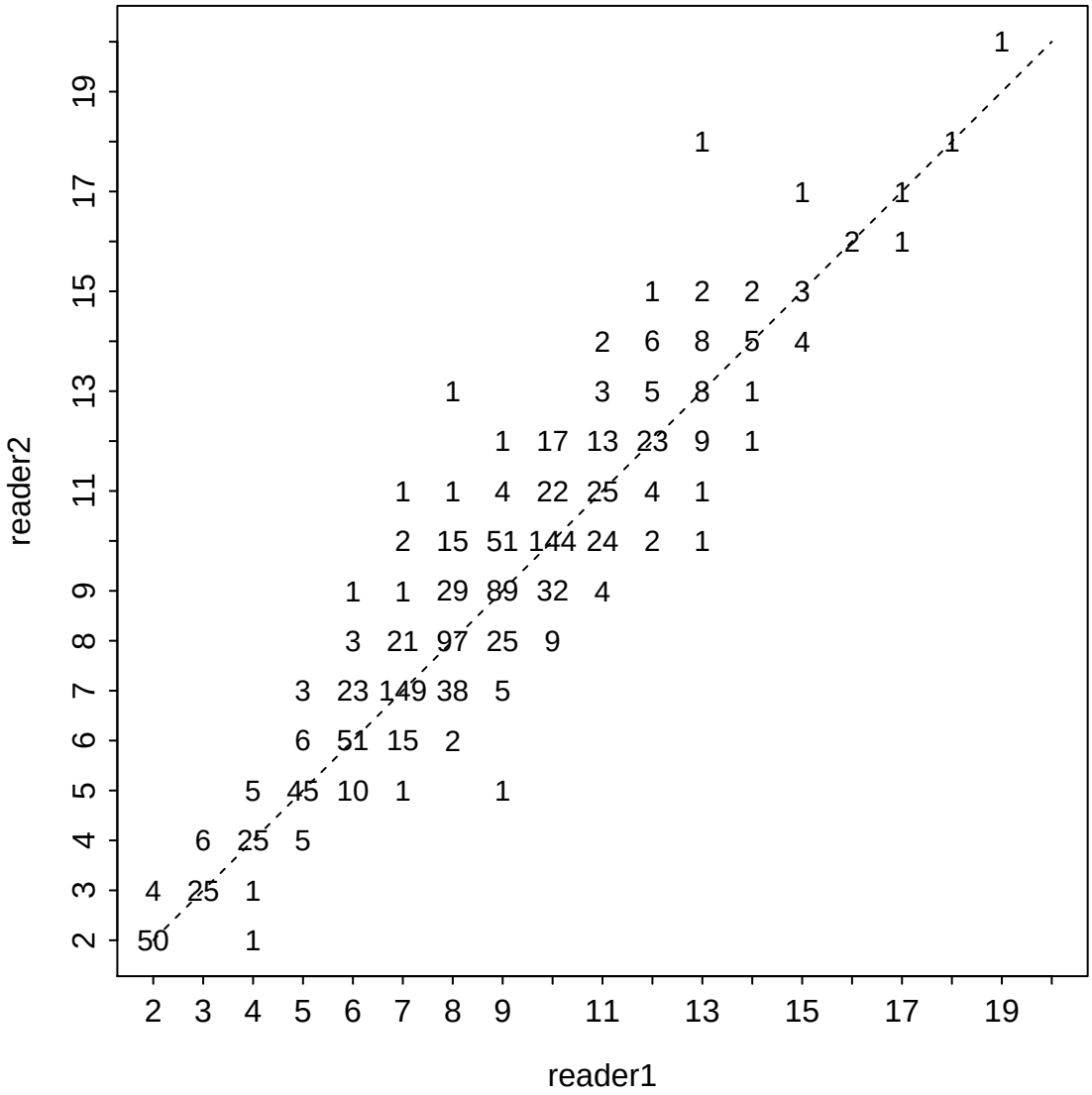



```
> plot(ab,diff=TRUE,show.n=FALSE,show.range=TRUE)                 # Left
> plot(ab,diff=TRUE,show.n=FALSE,show.pts=TRUE,transparency=1/25) # Right
```






```
> plot(ab,what="numbers",xlim=c(2,20),ylim=c(2,20))
```



Examine Age Precision

```
> ap <- agePrecision(reader2~reader1,data=SB)
> summary(ap,what="difference",digits=1)
   -4    -3    -2    -1     0     1     2     3     4     5
 0.08  0.08  2.16 14.06 61.81 16.31  4.58  0.67  0.08  0.17

> summary(ap,what="absolute difference",digits=2)
    0     1     2     3     4     5
61.81 30.37  6.74  0.75  0.17  0.17

> summary(ap,what="precision")
    n validn R  ACV   APE PercAgree
 1202   1202 2 3.98 2.815     61.81

> summary(ap,what="detail")  # only some rows shown

     reader2 reader1  avg        sd       APE       ACV
1          2       2  2.0 0.0000000  0.000000  0.000000
2          2       2  2.0 0.0000000  0.000000  0.000000
3          2       2  2.0 0.0000000  0.000000  0.000000
4          2       2  2.0 0.0000000  0.000000  0.000000
5          2       2  2.0 0.0000000  0.000000  0.000000
1198      17      15 16.0 1.4142136  6.250000  8.838835
1199      17      17 17.0 0.0000000  0.000000  0.000000
1200      18      13 15.5 3.5355339 16.129032 22.809896
1201      18      18 18.0 0.0000000  0.000000  0.000000
1202      20      19 19.5 0.7071068  2.564103  3.626189
```