Comparing Age Assignments

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Preliminaries

```
> library(FSA)                              # for ageBias(), agePrecision()
```

Loading Data

```
> SB <- read.csv("data/StripedBass4.csv")   # appropriately set the working directory before this
> 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 ...
```

Examine Age Bias

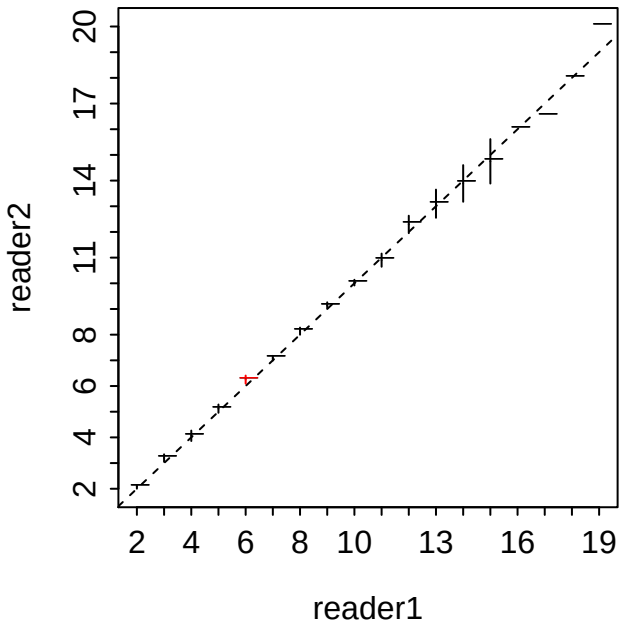
```
> ab <- ageBias(reader2~reader1,data=SB)
```

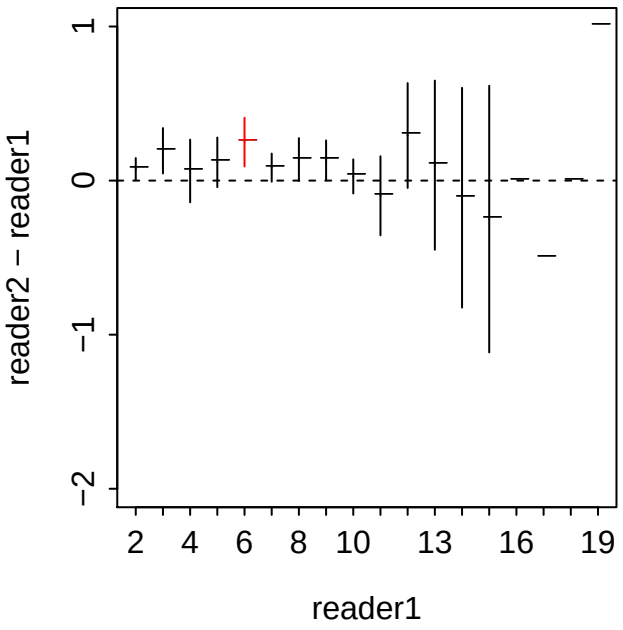
```
> summary(ab,what="table",flip.table=TRUE)
       reader1
reader2  2  3  4  5  6  7  8  9 10 11 12 13 14 15 16 17 18 19 20
     20  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  1  -
     19  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -
     18  -  -  -  -  -  -  -  -  -  -  -  1  -  -  -  -  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    McNemars  1  9.204793 0.0024138229
2 EvansHoenig  5 19.824421 0.0013481675
3     Bowkers 37 72.685469 0.0004126986
```

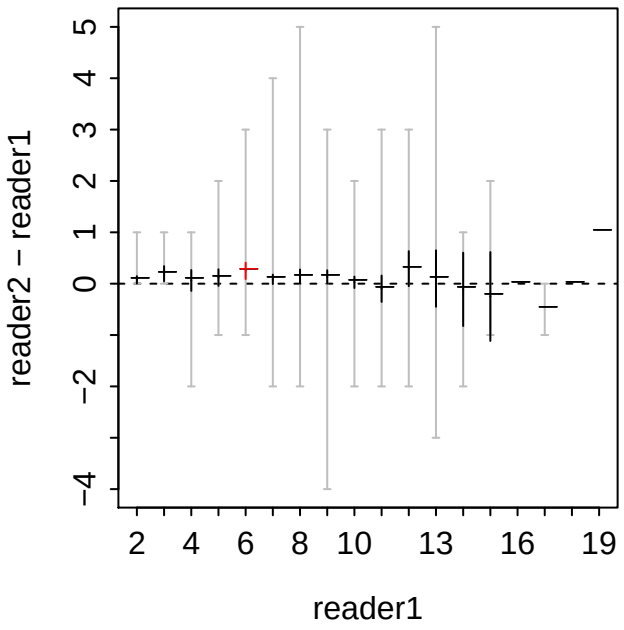
```
> summary(ab,what="bias")
 reader1   n min max  mean     SE      t  adj.p   sig   LCI   UCI
       2  54   2   3  2.07 0.0360  2.059 0.5329 FALSE  2.00  2.15
       3  31   3   4  3.19 0.0721  2.683 0.1527 FALSE  3.05  3.34
       4  32   2   5  4.06 0.0998  0.626 1.0000 FALSE  3.86  4.27
       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
```

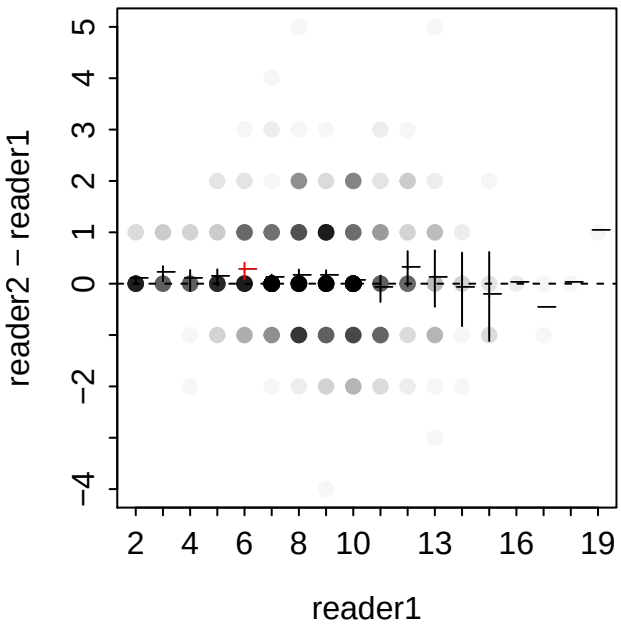
```
> plot(ab)                                  # Left
> plot(ab,diff=TRUE)                        # Right
```



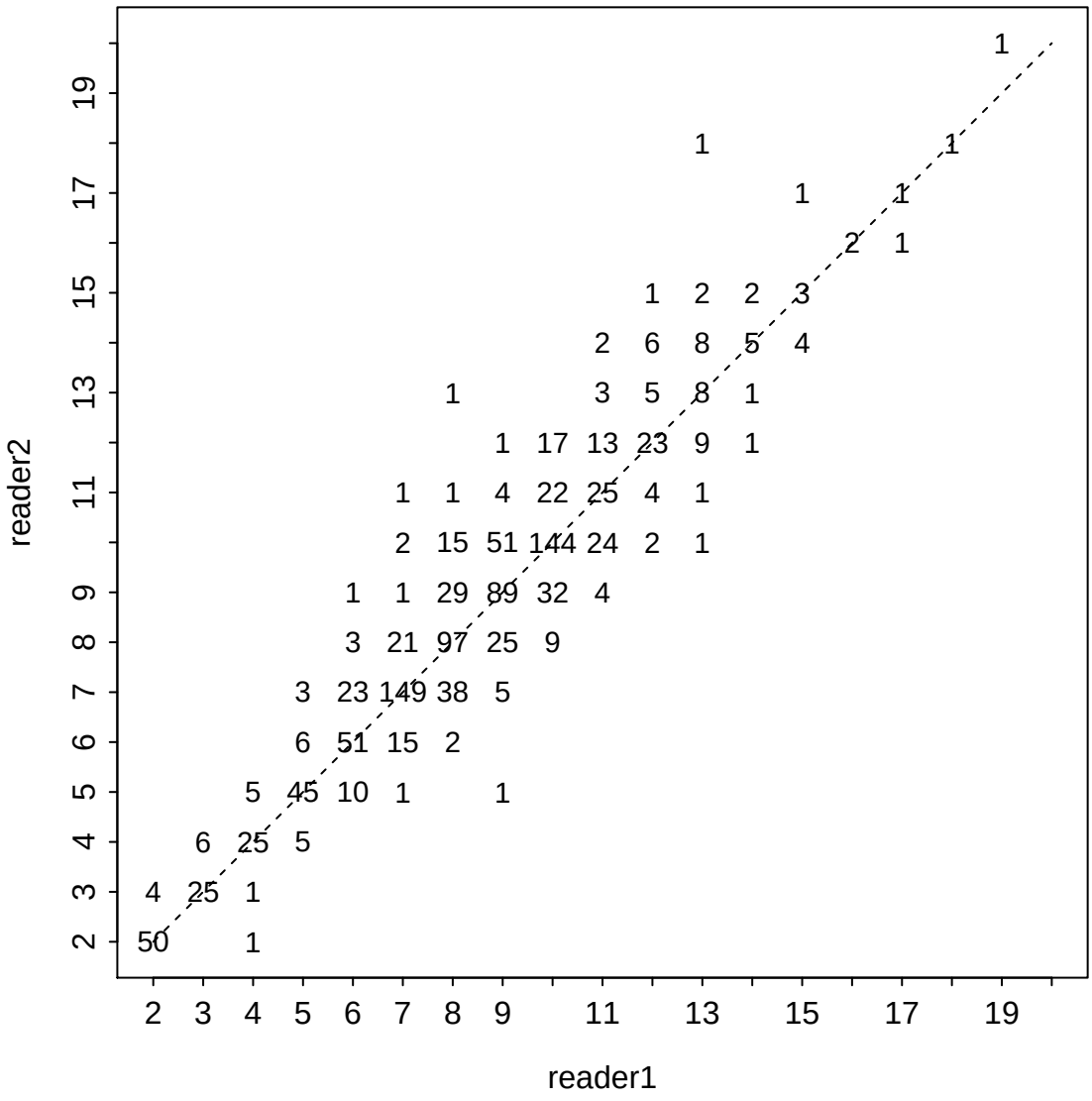



```
> plot(ab,diff=TRUE,show.range=TRUE)                    # Left
> plot(ab,diff=TRUE,show.pts=TRUE,transparency=1/25)    # Right
```






```
> 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 R  ACV   APE PercAgree
 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
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
```