Comparing Age Assignments

Derek H. Ogle, Northland College

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Preliminaries

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

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
```
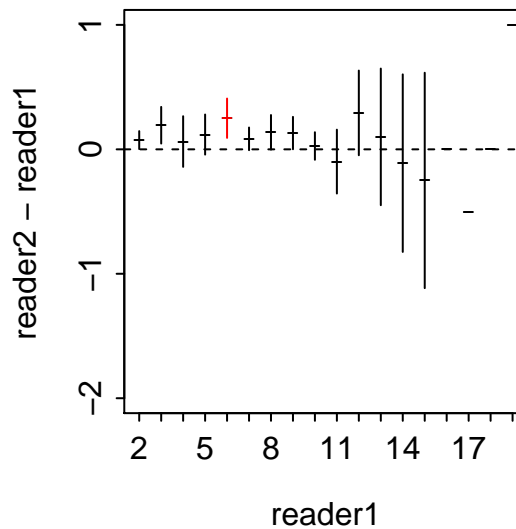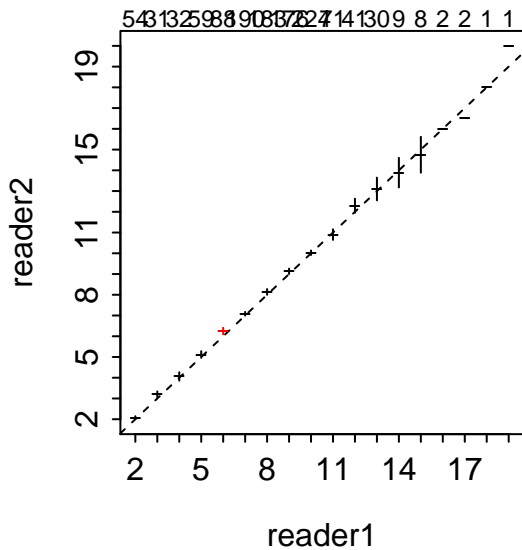
Examine Age Bias

```
> 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   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,show.n=FALSE)   # Right
```
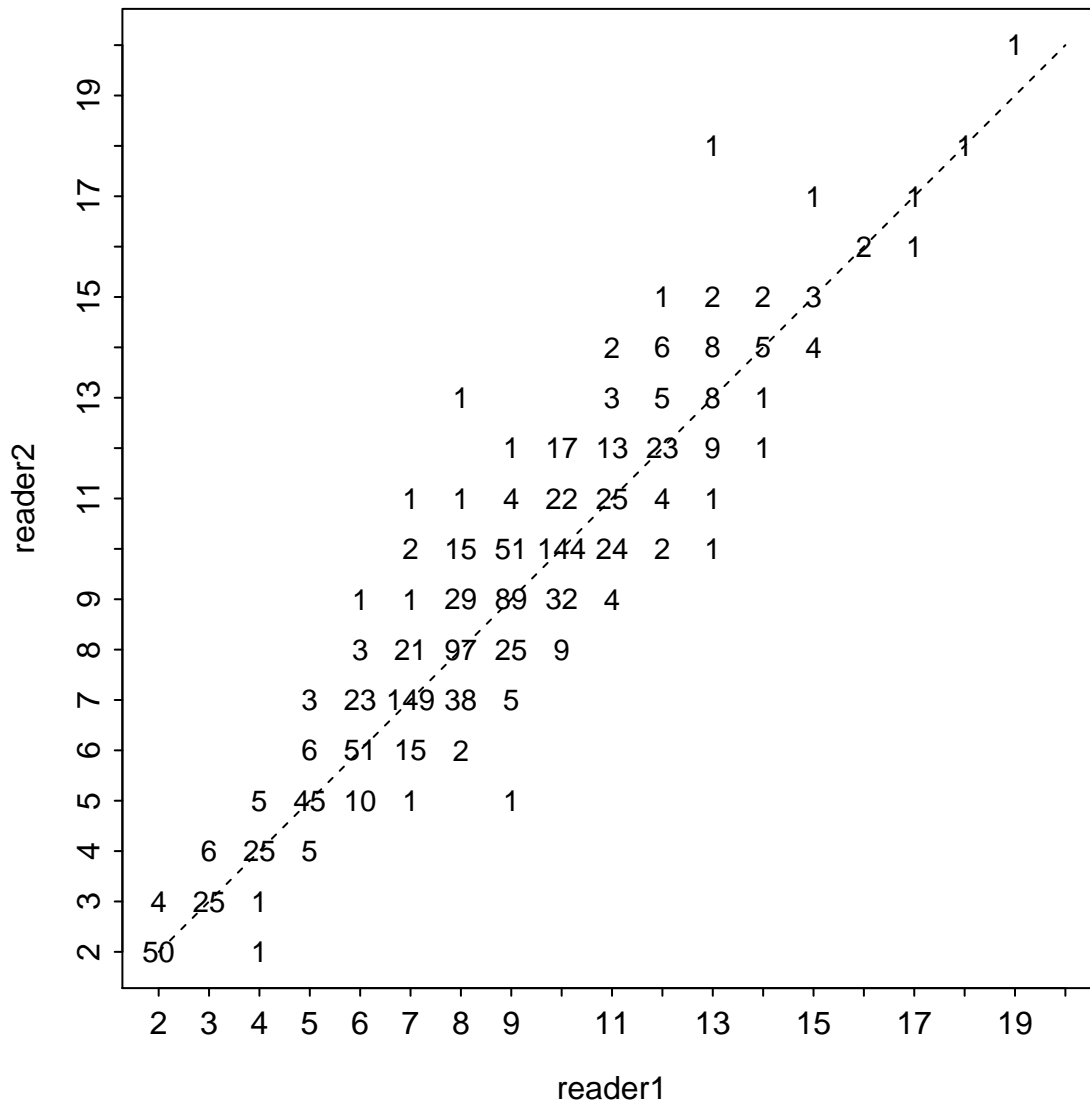


```
> plot(ab,diff=TRUE,show.n=FALSE,show.range=TRUE)                # Left
> plot(ab,diff=TRUE,show.n=FALSE,show.pts=TRUE,transparency=1/25) # Right
```
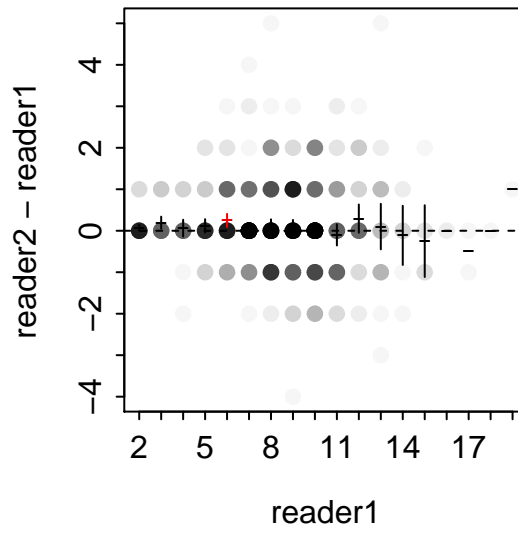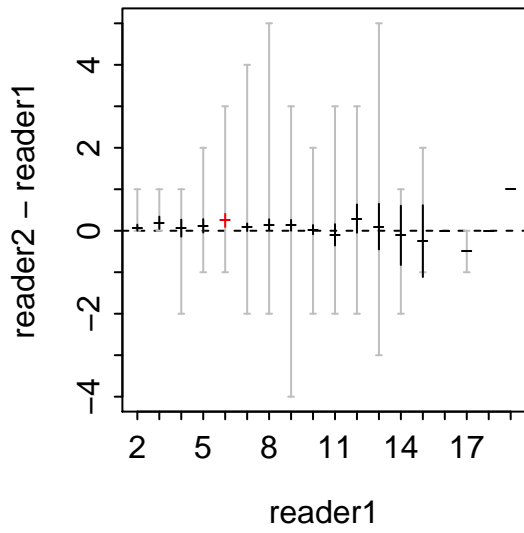
```
> plot(ab,what="numbers",xlim=c(2,20),ylim=c(2,20))
```

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 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
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
```