AIC model selection

Birth weight

Models:

```
full1.BW<-lme(BirthWeight~factor(BirthOrder),
      random = ~1|Litter, method = "ML", data = BW_data, na.action = na.exc
lude)
full2.BW <-lme(BirthWeight~factor(BirthOrder)+LitterSize,
      random = ~1|Litter, method = "ML", data = BW_data, na.action = na.exc
lude)
full3.BW t<-lme(BirthWeight~factor(BirthOrder)+factor(Sex),
      random = ~1|Litter, method = "ML", data = BW_data, na.action = na.exc
lude)
full4.BW <-lme(BirthWeight~factor(BirthOrder)+LitterSize+factor(Sex),
      random = ~1|Litter, method = "ML", data = BW_data, na.action = na.exc
lude)
```

Output:

```
> anova(full1.BW,full2.BW,full3.BW,full4.BW)
         Model df      AIC      BIC    logLik   Test  L.Ratio p-value
full1.BW     1  5 42.86529 54.10776 -16.43264
full2.BW     2  6 41.01459 54.50556 -14.50729 1 vs 2 3.850697  0.0497
full3.BW     3  6 42.25448 55.74545 -15.12724
full4.BW     4  7 41.02347 56.76293 -13.51173 3 vs 4 3.231013  0.0723
```

Weaning weight

Models:

```
full1.WW<-lme(WeaningWeight~factor(BirthOrder),
              random = ~1|Litter, method = "ML", data = WW_data, na.action
= na.exclude)
full2.WW<-lme(WeaningWeight ~factor(BirthOrder)+LitterSize,
              random = ~1|Litter, method = "ML", data = WW_data, na.action
= na.exclude)
full3.WW<-lme(WeaningWeight ~factor(BirthOrder)+factor(Sex),
              random = ~1|Litter, method = "ML", data = WW_data, na.action
= na.exclude)
full4.WW<-lme(WeaningWeight ~factor(BirthOrder)+LitterSize+factor(Sex),
              random = ~1|Litter, method = "ML", data = WW_data, na.action
= na.exclude)
```

Output:

```
> anova(full1.WW,full2.WW,full3.WW,full4.WW)
         Model df      AIC      BIC    logLik   Test  L.Ratio p-value
full1.WW     1  4 92.79299 96.77592 -42.39650
full2.WW     2  5 93.63438 98.61304 -41.81719 1 vs 2 1.158610  0.2818
full3.WW     3  5 92.43345 97.41211 -41.21673
full4.WW     4  6 93.10320 99.07759 -40.55160 3 vs 4 1.330253  0.2488
```

End weight

Models:

```
full1.EW<-lme(EndWeight~factor(BirthOrder),
              random = ~1|Litter, method = "ML", data = EW_data, na.action
= na.exclude)
full2.EW<-lme(EndWeight ~factor(BirthOrder)+LitterSize,
```

```
              random = ~1|Litter, method = "ML", data = EW_data, na.action
= na.exclude)
full3.EW<-lme(EndWeight ~factor(BirthOrder)+factor(Sex),
              random = ~1|Litter, method = "ML", data = EW_data, na.action
= na.exclude)
full4.EW<-lme(EndWeight ~factor(BirthOrder)+LitterSize+factor(Sex),
              random = ~1|Litter, method = "ML", data = EW_data, na.action
= na.exclude)
```

Output:

```
> anova(full1.EW,full2.EW,full3.EW,full4.EW)
         Model df      AIC      BIC    logLik   Test    L.Ratio p-value
full1.EW     1  4 166.8552 170.8382 -79.42761
full2.EW     2  5 168.7702 173.7489 -79.38510 1 vs 2 0.08502727  0.7706
full3.EW     3  5 166.3487 171.3274 -78.17436
full4.EW     4  6 168.3292 174.3036 -78.16458 3 vs 4 0.01956151  0.8888
```

Suckling latency

Models:

```
full6.drink<-lme(SucklingLatency~factor(BirthOrder),
                 random = ~1|Litter, method = "ML", data = SL_data, na.acti
on = na.exclude)
full7.drink<-lme(SucklingLatency~factor(BirthOrder)+LitterSize,
                 random = ~1|Litter, method = "ML", data = SL_data, na.acti
on = na.exclude)
full8.drink<-lme(SucklingLatency~factor(BirthOrder)+BirthWeight,
                 random = ~1|Litter, method = "ML", data = SL_data, na.acti
on = na.exclude)
full9.drink<-lme(SucklingLatency~BirthWeight,
                 random = ~1|Litter, method = "ML", data = SL_data, na.acti
on = na.exclude)
full10.drink<-lme(SucklingLatency~LitterSize,
                  random = ~1|Litter, method = "ML", data = SL_data, na.act
ion = na.exclude)
```

Output:

```
> anova(full6.drink,full7.drink,full10.drink)
             Model df      AIC      BIC    logLik   Test  L.Ratio p-value
full6.drink      1  5 133.3936 144.4170 -61.69679
full7.drink      2  6 135.3780 148.6062 -61.68901 1 vs 2 0.015549  0.9008
full10.drink     3  4 135.7369 144.5557 -63.86846 2 vs 3 4.358890  0.1131
```

Teat order

Models:

```
full1.teat<-lme(Teat~factor(BirthOrder),
           random = ~1|Piglet/Litter, method = "ML", data = teat_data,
na.action = na.exclude)
full2.teat<-lme(Teat~factor(BirthOrder)+factor(Week),
           random = ~1|Piglet/Litter, method = "ML", data = teat_data,
na.action = na.exclude)
full3.teat<-lme(Teat~factor(Week),
           random = ~1|Piglet/Litter, method = "ML", data = teat_data,
na.action = na.exclude)
full4.teat<-
lme(Teat~factor(BirthOrder)+factor(Week)+factor(BirthOrder):factor(Week),
           random = ~1|Piglet/Litter, method = "ML", data = teat_data,
na.action = na.exclude)
```

Output:

```
> anova(full1.teat,full2.teat,full3.teat,full4.teat)
           Model df      AIC      BIC    logLik   Test  L.Ratio p-value
full1.teat     1  5 94.42435 104.4610 -42.21218
full2.teat     2  6 96.39391 108.4379 -42.19696 1 vs 2 0.030443  0.8615
full3.teat     3  5 98.93503 108.9717 -44.46751 2 vs 3 4.541116  0.0331
full4.teat     4  7 98.30347 112.3548 -42.15174 3 vs 4 4.631557  0.0987
```

Sessions until criterion

Models:

```
full1.crit<-lme(Session_crit~factor(BirthOrder),
                random = ~1|Litter, method = "ML", data = crit_data,
na.action = na.exclude)
full2.crit<-lme(Session_crit~factor(Side),
                random = ~1|Litter, method = "ML", data = crit_data,
na.action = na.exclude)
full3.crit<-lme(Session_crit~factor(BirthOrder)+factor(Side),
                random = ~1|Litter, method = "ML", data = crit_data,
na.action = na.exclude)
full4.crit<-
lme(Session_crit~factor(BirthOrder)+factor(Side)+factor(BirthOrder):factor(
Side),
                random = ~1|Litter, method = "ML", data = crit_data,
na.action = na.exclude)
full5.crit<-
lme(Session_crit~factor(BirthOrder)+factor(BirthOrder):factor(Side),
                random = ~1|Litter, method = "ML", data = crit_data,
na.action = na.exclude)
```

Output:

```
> anova(full1.crit, full2.crit, full3.crit, full4.crit)
           Model df       AIC       BIC    logLik   Test    L.Ratio p-value
full1.crit     1  4 100.23999 102.79622 -46.12000
full2.crit     2  4  95.16009  97.71632 -43.58005
full3.crit     3  5  96.94126 100.13655 -43.47063 2 vs 3 0.21883100  0.6399
full4.crit     4  6  98.92177 102.75612 -43.46089 3 vs 4 0.01948827  0.8890
```

Correct choices

Models:

```
full1.learn<-lme(GoodChoice~factor(Session)+factor(BirthOrder)+factor(Sex)+
          factor(BirthOrder):factor(Session),
        random = ~1|Pig/Litter, method = "ML", data = learn_data, na.action
= na.exclude)
full2.learn<-lme(GoodChoice~factor(Session)+factor(BirthOrder)+factor(Sex),
        random = ~1|Pig/Litter, method = "ML", data = learn_data, na.action
= na.exclude)
full3.learn<-lme(GoodChoice~factor(Session)+factor(BirthOrder)+
        factor(BirthOrder):factor(Session),
        random = ~1|Pig/Litter, method = "ML", data = learn_data, na.action
= na.exclude)
full4.learn<-lme(GoodChoice~factor(Session)+factor(Sex)+
        factor(Sex):factor(Session),
        random = ~1|Pig/Litter, method = "ML", data = learn_data, na.action
= na.exclude)
full5.learn<-lme(GoodChoice~factor(BirthOrder)+factor(Sex)+
```

```
        factor(Sex):factor(BirthOrder),
        random = ~1|Pig/Litter, method = "ML", data = learn_data, na.action
= na.exclude)
full6.learn<-lme(GoodChoice~factor(Session)+factor(BirthOrder),
        random = ~1|Pig/Litter, method = "ML", data = learn_data, na.action
= na.exclude)
full7.learn<-lme(GoodChoice~factor(Session)+factor(Sex),
        random = ~1|Pig/Litter, method = "ML", data = learn_data, na.action
= na.exclude)
full8.learn<-lme(GoodChoice~factor(BirthOrder)+factor(Sex),
        random = ~1|Pig/Litter, method = "ML", data = learn_data, na.action
= na.exclude)
full9.learn<-lme(GoodChoice~Session,
        random = ~1|Pig/Litter, method = "ML", data = learn_data, na.action
= na.exclude)
full10.learn<-lme(GoodChoice~factor(BirthOrder),
        random = ~1|Pig/Litter, method = "ML", data = learn_data, na.action
= na.exclude)
full11.learn<-lme(GoodChoice~factor(Sex),
        random = ~1|Pig/Litter, method = "ML", data = learn_data, na.action
= na.exclude)
```

Output when the four pigs with higher reward are included:

```
> anova(full1.learn,full2.learn,full3.learn,full4.learn,full5.learn,full6.l
earn,
+       full7.learn, full8.learn, full9.learn, full10.learn, full11.learn)
             Model df      AIC      BIC    logLik    Test   L.Ratio p-value
full1.learn      1 26 476.5341 558.5196 -212.2670
full2.learn      2 16 462.8229 513.2756 -215.4114  1 vs 2   6.28883  0.7904
full3.learn      3 25 474.9533 553.7856 -212.4767  2 vs 3   5.86959  0.7529
full4.learn      4 25 477.1447 555.9770 -213.5724
full5.learn      5  7 659.2164 681.2895 -322.6082  4 vs 5 218.07168  <.0001
full6.learn      6 15 461.3111 508.6104 -215.6555  5 vs 6 213.90535  <.0001
full7.learn      7 15 461.1239 508.4233 -215.5619
full8.learn      8  6 657.7945 676.7143 -322.8973  7 vs 8 214.67064  <.0001
full9.learn      9 14 459.4067 503.5528 -215.7034  8 vs 9 214.38781  <.0001
full10.learn    10  5 657.0918 672.8583 -323.5459 9 vs 10 215.68513  <.0001
full11.learn    11  5 656.1663 671.9328 -323.0832
```

Output when the four pigs with higher reward are excluded:

```
> anova(full1.learn,full2.learn,full3.learn,full4.learn,full5.learn,full6.l
earn,
+       full7.learn, full8.learn, full9.learn, full10.learn, full11.learn)
             Model df      AIC      BIC    logLik    Test   L.Ratio p-value
full1.learn      1 25 404.7236 480.4846 -177.3618
full2.learn      2 15 391.5536 437.0102 -180.7768  1 vs 2   6.82998  0.7414
full3.learn      3 24 402.7686 475.4991 -177.3843  2 vs 3   6.78501  0.6595
full4.learn      4 24 404.2240 476.9545 -178.1120
full5.learn      5  6 575.0232 593.2058 -281.5116  4 vs 5 206.79925  <.0001
full6.learn      6 14 389.5896 432.0157 -180.7948  5 vs 6 201.43363  <.0001
full7.learn      7 14 389.5545 431.9807 -180.7773
full8.learn      8  5 573.6483 588.8005 -281.8241  7 vs 8 202.09374  <.0001
full9.learn      9 13 387.6094 427.0051 -180.8047  8 vs 9 202.03882  <.0001
full10.learn    10  4 572.3706 584.4923 -282.1853 9 vs 10 202.76112  <.0001
full11.learn    11  4 571.8941 584.0158 -281.9470
```

Optimistic choice

Models:

```
n1<-glmer(OC/Trials ~ Cue + BirthOrder + Sex + BirthOrder:Cue + Sex:Cue +
(1|Pig_ID/Session),
          family = binomial, weights = Trials, data = test_data2,
          control = glmerControl(optimizer = "bobyqa", optCtrl =
list(maxfun=2e5)))
n2<-glmer(OC/Trials ~ Cue + (1|Pig_ID/Session),
          family = binomial, weights = Trials, data = test_data2,
          control = glmerControl(optimizer = "bobyqa", optCtrl =
list(maxfun=2e5)))
n3<-glmer(OC/Trials ~ BirthOrder + (1|Pig_ID/Session),
          family = binomial, weights = Trials, data = test_data2,
          control = glmerControl(optimizer = "bobyqa", optCtrl =
list(maxfun=2e5)))
n4<-glmer(OC/Trials ~ Sex + (1|Pig_ID/Session),
          family = binomial, weights = Trials, data = test_data2,
          control = glmerControl(optimizer = "bobyqa", optCtrl =
list(maxfun=2e5)))
n5<-glmer(OC/Trials ~ BirthOrder + BirthOrder:Cue + (1|Pig_ID/Session),
          family = binomial, weights = Trials, data = test_data2,
          control = glmerControl(optimizer = "bobyqa", optCtrl =
list(maxfun=2e5)))
n6<-glmer(OC/Trials ~ Sex + Sex:Cue + (1|Pig_ID/Session),
          family = binomial, weights = Trials, data = test_data2,
          control = glmerControl(optimizer = "bobyqa", optCtrl =
list(maxfun=2e5)))
n7<-glmer(OC/Trials ~ Cue + BirthOrder + BirthOrder:Cue +
(1|Pig_ID/Session),
          family = binomial, weights = Trials, data = test_data2,
          control = glmerControl(optimizer = "bobyqa", optCtrl =
list(maxfun=2e5)))
n8<-glmer(OC/Trials ~ Cue + Sex + Sex:Cue + (1|Pig_ID/Session),
          family = binomial, weights = Trials, data = test_data2,
          control = glmerControl(optimizer = "bobyqa", optCtrl =
list(maxfun=2e5)))
n9<-glmer(OC/Trials ~ BirthOrder + Sex + (1|Pig_ID/Session),
          family = binomial, weights = Trials, data = test_data2,
          control = glmerControl(optimizer = "bobyqa", optCtrl =
list(maxfun=2e5)))
```

Output:

```
Model selection table
     (Int) BirthOrder    Cue Gnd BirthOrder:Cue Cue:Gnd          family df   logLik  AICc delt
a weight
n2 -1.0880     0.1433                          binomial(logit)  4 -331.651 671.4  0.00  0.506
n8 -0.9040     0.1262   +              +        binomial(logit)  6 -330.748 673.8  2.34  0.157
n6 -0.9040              +              +        binomial(logit)  6 -330.748 673.8  2.34  0.157
n5 -1.1240   +                  +               binomial(logit)  6 -331.469 675.2  3.78  0.077
n7 -1.1240   + 0.1396           +               binomial(logit)  6 -331.469 675.2  3.78  0.077
n1 -0.8337   + 0.1045   +       +       +       binomial(logit)  8 -330.697 677.9  6.43  0.020
n4 -0.5184              +                       binomial(logit)  4 -336.882 681.9 10.46  0.003
n3 -0.6938   +                                  binomial(logit)  4 -337.535 683.2 11.77  0.001
n9 -0.5158   +          +                       binomial(logit)  5 -336.882 684.0 12.53  0.001
```

Latency

Models:

```
full1lat<-lme(Latency~factor(BirthOrder),
```

```
           random = ~1|Pig_ID/Session, method = "ML", data = test_data2,
na.action = na.exclude)
full2lat<-lme(Latency~factor(Sex),
           random = ~1|Pig_ID/Session, method = "ML", data = test_data2,
na.action = na.exclude)
full3lat<-lme(Latency~Cue,
           random = ~1|Pig_ID/Session, method = "ML", data = test_data2,
na.action = na.exclude)
full4lat<-lme(Latency~factor(BirthOrder)+Cue,
           random = ~1|Pig_ID/Session, method = "ML", data = test_data2,
na.action = na.exclude)
full5lat<-lme(Latency~factor(BirthOrder)+Cue+factor(BirthOrder):Cue,
           random = ~1|Pig_ID/Session, method = "ML", data = test_data2,
na.action = na.exclude)
full6lat<-lme(Latency~factor(Sex)+Cue,
           random = ~1|Pig_ID/Session, method = "ML", data = test_data2,
na.action = na.exclude)
full7lat<-lme(Latency~factor(Sex)+Cue+factor(Sex):Cue,
           random = ~1|Pig_ID/Session, method = "ML", data = test_data2,
na.action = na.exclude)
full8lat<-lme(Latency~factor(BirthOrder)+factor(Sex),
           random = ~1|Pig_ID/Session, method = "ML", data = test_data2,
na.action = na.exclude)
full9lat<-
lme(Latency~factor(BirthOrder)+factor(Sex)+factor(BirthOrder):factor(Sex),
           random = ~1|Pig_ID/Session, method = "ML", data = test_data2,
na.action = na.exclude)
full10lat<-lme(Latency~factor(BirthOrder)+factor(Sex)+Cue,
            random = ~1|Pig_ID/Session, method = "ML", data = test_data2,
na.action = na.exclude)
full11lat<-
lme(Latency~factor(BirthOrder)+factor(Sex)+Cue+factor(BirthOrder):factor(Se
x),
            random = ~1|Pig_ID/Session, method = "ML", data = test_data2,
na.action = na.exclude)
full12lat<-
lme(Latency~factor(BirthOrder)+factor(Sex)+Cue+factor(BirthOrder):factor(Se
x)+
              factor(BirthOrder):Cue,
            random = ~1|Pig_ID/Session, method = "ML", data = test_data2,
na.action = na.exclude)
full13lat<-
lme(Latency~factor(BirthOrder)+factor(Sex)+Cue+factor(BirthOrder):factor(Se
x)+
              factor(Sex):Cue,
            random = ~1|Pig_ID/Session, method = "ML", data = test_data2,
na.action = na.exclude)
full14lat<-
lme(Latency~factor(BirthOrder)+factor(Sex)+Cue+factor(BirthOrder):factor(Se
x)+
              factor(BirthOrder):Cue+factor(Sex):Cue,
            random = ~1|Pig_ID/Session, method = "ML", data = test_data2,
na.action = na.exclude)
full15.lat<-lme(Latency~Weight+Cue+Weight:Cue,
                  random = ~1|Pig_ID/Session, method = "ML", data =
test_data2, na.action = na.exclude)
full16.lat<-lme(Latency~factor(Sex)+Cue+factor(Sex):Cue+Weight,
                  random = ~1|Pig_ID/Session, method = "ML", data =
test_data2, na.action = na.exclude)
full17.lat<-lme(Latency~factor(Sex)+Cue+factor(Sex):Cue+
                    Weight+Weight:factor(Cue),
```

```
                    random = ~1|Pig_ID/Session, method = "ML", data =
test_data2, na.action = na.exclude)
full18.lat<-lme(Latency~Cue+factor(Sex):Cue+Weight:Cue+
                      Weight:factor(Sex),
                    random = ~1|Pig_ID/Session, method = "ML", data =
test_data2, na.action = na.exclude)
full19.lat<-
lme(Latency~factor(BirthOrder)+Weight+factor(BirthOrder):Cue+Weight:Cue,
                    random = ~1|Pig_ID/Session, method = "ML", data =
test_data2, na.action = na.exclude)
full20.lat<-lme(Latency~factor(BirthOrder)+Weight+factor(BirthOrder):Cue,
                    random = ~1|Pig_ID/Session, method = "ML", data =
test_data2, na.action = na.exclude)
```

output:

```
> anova(full1lat, full2lat, full3lat, full4lat, full5lat, full6lat, full7la
t, full8lat, full9lat, full10lat, full11lat,
+       full12lat, full13lat, full14lat,full15.lat,full16.lat,full17.lat,fu
ll18.lat,full19.lat,full20.lat)
           Model df      AIC      BIC    logLik     Test  L.Ratio p-value
full1lat       1  5 702.7894 721.5523 -346.3947
full2lat       2  5 698.2752 717.0381 -344.1376
full3lat       3  5 614.1880 632.9508 -302.0940
full4lat       4  6 616.0908 638.6062 -302.0454   3 vs 4  0.09722  0.7552
full5lat       5  7 617.7105 643.9785 -301.8553   4 vs 5  0.38026  0.5375
full6lat       6  6 611.0213 633.5368 -299.5107   5 vs 6  4.68919  0.0304
full7lat       7  7 602.0260 628.2940 -294.0130   6 vs 7 10.99530  0.0009
full8lat       8  6 699.5600 722.0754 -343.7800   7 vs 8 99.53397  <.0001
full9lat       9  7 700.9405 727.2085 -343.4702   8 vs 9  0.61953  0.4312
full10lat     10  7 612.2438 638.5118 -299.1219
full11lat     11  8 613.7539 643.7745 -298.8770 10 vs 11  0.48991  0.4840
full12lat     12  9 615.3683 649.1415 -298.6842 11 vs 12  0.38560  0.5346
full13lat     13  9 604.7707 638.5438 -293.3853
full14lat     14 10 605.3708 642.8965 -292.6854 13 vs 14  1.39985  0.2367
full15.lat    15  7 608.1044 634.3724 -297.0522 14 vs 15  8.73359  0.0331
full16.lat    16  8 601.8758 631.8964 -292.9379 15 vs 16  8.22855  0.0041
full17.lat    17 12 603.5350 648.5659 -289.7675 16 vs 17  6.34084  0.1751
full18.lat    18  8 604.9965 635.0170 -294.4982 17 vs 18  9.46145  0.0505
full19.lat    19  9 611.0626 644.8358 -296.5313 18 vs 19  4.06614  0.0438
full20.lat    20  8 613.9008 643.9214 -298.9504 19 vs 20  4.83820  0.0278
```