Results models

1: Log(odds) = e^(alpha + β1 \* ratingdiff)

Alpha should obviously be zero though, now it equals 2 ratingpoints…

(Intercept) ratingdiff

coefficients -0.005773905 0.004299566

SE 0.0137094542 0.0000734468

AIC BIC

30771.6 30788.05

2: Log(odds) = e^(alpha + β1 \* ratingdiff + β2 \* ratingdiffClay + β3 \* ratingdiffHard + β4 \* ratingGrass + β5 \* ratingdiffCarpet)  
  
  
 Estimate Std. Error z value Pr(>|z|)

(Intercept) -4.999e-03 1.373e-02 -0.364 0.715716

ratingdiff 3.094e-03 1.904e-04 16.245 < 2e-16 \*\*\*

ratingClaydiff 5.102e-04 9.205e-05 5.543 2.98e-08 \*\*\*

ratingHarddiff 5.989e-04 1.413e-04 4.237 2.27e-05 \*\*\*

ratingGrassdiff 3.123e-04 8.420e-05 3.709 0.000208 \*\*\*

ratingCarpetdiff 1.855e-05 9.904e-05 0.187 0.851416

AIC BIC

30725.01 30774.08

3: Log(odds) = e^(alpha + (β1 + β2 \* dummyB05\*) ratingdiff)

Coefficients:

Estimate Std. Error z value Pr(>|z|)

(Intercept) -5.061e-03 1.372e-02 -0.369 0.712

ratingdiff 4.001e-03 8.346e-05 47.946 < 2e-16 \*\*\*

DummyBo5TimesRatingdiff 1.231e-03 1.784e-04 6.898 5.28e-12 \*\*\*

AIC BIC

30723.71 30748.14

3: Log(odds) = e^(alpha + β1ratingdiff + β2 dummyB05)

Coefficients:

Estimate Std. Error z value Pr(>|z|)

(Intercept) -1.511e-02 1.372e-02 -1.101 0.271

ratingdiff 4.132e-03 7.953e-05 51.958 < 2e-16 \*\*\*

DummyBo5 1.676e-01 3.190e-02 5.256 1.47e-07 \*\*\*

AIC: 30745

BIC: 30769.17

As expected this is worse than with the interactionterm

4: Log(odds) = e^(alpha + (β1 + β6 \* dummyB05\*) ratingdiff) β2 \* ratingdiffClay + β3 \* ratingdiffHard + β4 \* ratingGrass + β5 \* ratingdiffCarpet)

(Intercept

Estimate Std. Error z value Pr(>|z|)

(Intercept) -4.328e-03 1.374e-02 -0.315 0.75267

ratingdiff 2.771e-03 1.953e-04 14.190 < 2e-16 \*\*\*

ratingClaydiff 5.198e-04 9.217e-05 5.639 1.71e-08 \*\*\*

ratingHarddiff 6.055e-04 1.414e-04 4.283 1.85e-05 \*\*\*

ratingGrassdiff 3.154e-04 8.423e-05 3.745 0.00018 \*\*\*

ratingCarpetdiff 2.537e-05 9.906e-05 0.256 0.79788

DummyBo5TimesRatingdiff 1.253e-03 1.787e-04 7.011 2.37e-12 \*\*\*

AIC: 30675

BIC: 30732.48

Let’s drop useless variable ratingcarpetdiff

5: Log(odds) = e^(alpha + (β1 + β5 \* dummyB05\*) ratingdiff) β2 \* ratingdiffClay + β3 \* ratingdiffHard + β4 \* ratingGrass )

Estimate Std. Error z value Pr(>|z|)

(Intercept) -4.351e-03 1.373e-02 -0.317 0.751

ratingdiff 2.772e-03 1.952e-04 14.203 < 2e-16 \*\*\*

ratingClaydiff 5.202e-04 9.216e-05 5.645 1.65e-08 \*\*\*

ratingHarddiff 6.117e-04 1.393e-04 4.392 1.12e-05 \*\*\*

ratingGrassdiff 3.225e-04 7.952e-05 4.056 4.99e-05 \*\*\*

DummyBo5TimesRatingdiff 1.253e-03 1.787e-04 7.008 2.41e-12 \*\*\*

AIC: 30674

BIC: 30722.41

6: Log(odds) = e^(alpha + (β1 ratingdiff + β2 ratingdiffCurrentSurface)

Estimate Std. Error z value Pr(>|z|)

(Intercept) -0.0138305 0.0138156 -1.001 0.317

ratingdiff 0.0024679 0.0001185 20.824 <2e-16 \*\*\*

ratingdiffCurrentSurface 0.0022303 0.0001173 19.014 <2e-16 \*\*\*

AIC: 30405

BIC: 30429.3

7: Log(odds) = e^(alpha + (β1 + β3 \* dummyB05\*) ratingdiff) + β2 ratingdiffCurrentSurface)

Estimate Std. Error z value Pr(>|z|)

(Intercept) -0.0142622 0.0138278 -1.031 0.302

ratingdiff 0.0020882 0.0001273 16.399 < 2e-16 \*\*\*

ratingdiffCurrentSurface 0.0022813 0.0001180 19.330 < 2e-16 \*\*\*

DummyBo5TimesRatingdiff 0.0013918 0.0001801 7.727 1.1e-14 \*\*\*

AIC: 30344

BIC: 30376.29

7: Log(odds) = e^(alpha + β1ratingdiff + β2 ratingdiffCurrentSurface + β3 \* dummyB05 \* avgratingdiff)

Coefficients:

Estimate Std. Error z value Pr(>|z|)

(Intercept) 0.0069162 0.0138292 0.500 0.617

ratingdiff 0.0022425 0.0001212 18.500 <2e-16 \*\*\*

ratingdiffCurrentSurface 0.0020576 0.0001190 17.295 <2e-16 \*\*\*

DummyBo5TimesAvgRatingdiff 0.0017464 0.0001969 8.871 <2e-16 \*\*\*

AIC: 30323  
BIC: 30355.53

Apparantly an improvement over normal 7!

7\_leftright: Log(odds) = e^(alpha + (β1 + β3 \* dummyB05 + β4 \* dummyLeftsVsRight) ratingdiff) + β2 ratingdiffCurrentSurface)

Estimate Std. Error z value Pr(>|z|)

(Intercept) -0.0196952 0.0138271 -1.424 0.1543

ratingdiff 0.0019948 0.0001334 14.952 < 2e-16 \*\*\*

ratingdiffCurrentSurface 0.0022849 0.0001180 19.357 < 2e-16 \*\*\*

DummyBo5TimesRatingdiff 0.0013758 0.0001802 7.633 2.29e-14 \*\*\*

DummyLeftvsRightTimesRatingdiff 0.0004105 0.0001795 2.287 0.0222 \* (

AIC: 30339

BIC: 30380.17

8: Log(odds) = e^(alpha + β1 ratingdiff + β2 \* dummyB05\* ratingdiffSquaredSameSign)

ratingdiffSquaredSameSign, the idea behind this one is if the value is -5 it will give back -25 and when the value is 5 it will give back 25 as well.

Estimate Std. Error z value Pr(>|z|)

(Intercept) -2.421e-02 1.371e-02 -1.766 0.0774

ratingdiff 4.025e-03 8.199e-05 49.089 < 2e-16 \*\*\*

DummyBo5TimesRatingdiffSquaredSameSign 3.722e-06 5.585e-07 6.664 2.67e-11 \*\*\*

AIC: 30719  
BIC: 30743.34

Appears to be slightly better than model 3 which is quite interesting, maybe some data mining for best value of ratingdiff^2 \* Same sign?

9: Log(odds) = e^(alpha + (β1 + β2 \* dummyB05\*) ratingdiff + β3 \* dummyB05\* ratingdiffSquaredSameSign)

Estimate Std. Error z value Pr(>|z|)

(Intercept) -2.412e-02 1.372e-02 -1.758 0.0787 .

ratingdiff 4.003e-03 8.347e-05 47.958 <2e-16 \*\*\*

DummyBo5TimesRatingdiff 5.368e-04 4.150e-04 1.293 0.1959

DummyBo5TimesRatingdiffSquaredSameSign 2.257e-06 1.243e-06 1.816 0.0694 .

AIC: 30719

BIC: 30751.83

This shows an error in thinking from me, as was in an assignment, these 2 variables will have almost perfect correlation making both of them insignificant and unlikely to improve my predictions.

10: 4 separate models! (comparable with model 6)

Log(odds) = e^(alpha + (β1 ratingdiff + β2 ratingdiffCurrentSurface)

Estimate Std. Error z value Pr(>|z|)

(Intercept) 0.0307843 0.0194147 1.586 0.1128

DummyClay -0.0281581 0.0304891 -0.924 0.3557

DummyGrass -0.0276381 0.0487968 -0.566 0.5711

DummyCarpet -0.1517782 0.0619484 -2.450 0.0143 \*

Hardratingdiff 0.0028278 0.0002160 13.090 < 2e-16 \*\*\*

Grassratingdiff 0.0028366 0.0002634 10.770 < 2e-16 \*\*\*

Carpetratingdiff 0.0029861 0.0003672 8.131 4.24e-16 \*\*\*

HardratingdiffCurrentSurface 0.0018203 0.0002118 8.594 < 2e-16 \*\*\*

ClayratingdiffCurrentSurface 0.0041550 0.0001216 34.178 < 2e-16 \*\*\*

GrassratingdiffCurrentSurface 0.0027688 0.0002948 9.391 < 2e-16 \*\*\*

CarpetratingdiffCurrentSurface 0.0007628 0.0004138 1.843 0.0653 .

AIC: 30465

BIC: 30554.82